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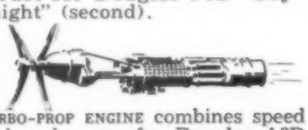
M A G A Z I N E

Including SOUTHERN FLIGHT and MODERN AIRPORTS

PIPER PACERS

ROCKET ENGINE delivers supersonic speed for Douglas "Skyrocket" (top).

TWIN-JET ENGINE gives pure jet thrust for Douglas F3D "Skyknight" (second).



TURBO-PROP ENGINE combines speed and endurance for Douglas A2D "Skyshark" (third).

RECIPROCATING ENGINE provides work-horse efficiency for Douglas AD "Skyraider" (bottom).

Experience with all four modern types of power for aircraft in one manufacturing plant is unique. Yet Douglas has that experience as the result of prudent, peace-time planning with the Navy.

Best known of these Big Four is the AD-Skyraider. This reciprocating-engined attack bomber has been in production since 1946, and is now a battle-tested veteran.

In 1950 the twin-jet F3D Skyknight was started down the production line at El Segundo.

Also in volume production is the A2D Skyshark, turbo-prop attack plane. And the rocket-powered D-558-2 Skyrocket recently set new world records for speed and altitude as it sought scientific data to help build tomorrow's aircraft.

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Allison Turbo-Prop Engines Power 3 New Cargo Planes—

★ **The Lockheed XC-130**

★ **The Douglas R6D**

★ **The Lockheed R7O**

While testing continues with the first U.S. Turbine Transport—the Allison Turbo-Liner, built by Convair—military contracts have been awarded for the installation of Allison Turbo-Prop engines in three additional types of transport aircraft.

★ The Lockheed XC-130—a U.S.A.F. four-engine medium cargo plane—is *the first military transport ever designed originally around Turbo-Prop power.* It won U.S.A.F. design competition over five other makes and the selection of Allison engines represents another *first* for Allison in the development of turbine transports in this country.

★ The new Navy-sponsored R6D is a modified configuration of the world-famous Douglas DC6A Liftmaster.

★ The Navy R7O is the new turbine version of the Lockheed Super Constellation.

Allison Turbo-Prop engines were selected for all three aircraft because they develop more power with less than half the weight of present engines in this power class.

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Super Cub of flying missionary hauls as many as four people at one time from disaster scene.
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Doing jobs no other plane can do so well—that's the role of the Piper Super Cub, the extraordinary utility plane which can take off and land in five lengths, or less, of its own fuselage!

Good high-altitude performance, remarkable slow-flight characteristics for patrol, and the ability to haul as much as 1,000* pounds are further important reasons why the Super Cub is being used in ways that planes could never be used before—on the farm, in industry, for aerial application of chemicals, and for general utility flying.

Smart flying operators, too, are replacing their "program-weary" aircraft with the 90 or 125 horsepower Super Cub both to perk up their private business and to profit from many new sources of revenue. For further information on the Super Cub see your nearest Piper dealer or write Dept. F-11.

*Under Part 8 of Civil Air Regulations for special purpose flying.

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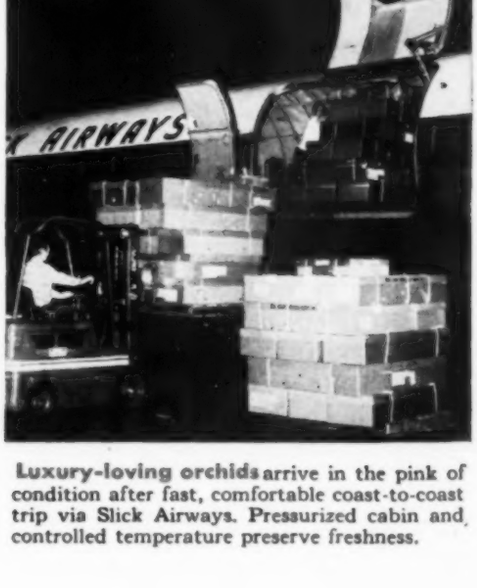
New Phillips 66 platform-type tank trucks rapidly refuel Slick super-freighters. Two enormous cargo doors permit simultaneous loading and unloading of Slick's new DC-6A's.

SLICK AIRWAYS, large scheduled carrier of commercial airfreight, has recently added a fleet of six new Douglas DC-6A super-freight planes. These planes maintain regular, 9-hour, coast-to-coast flights . . . faster than many passenger plane schedules . . at regular airfreight rates!

When speed and dependability are essential, manufacturers ship via Slick Airways. And because performance and dependability are imperative in the air, Slick fuels with Phillips *66* Aviation gasoline. More and more large commercial airlines and private plane owners are using Phillips *66* high-octane fuels and Phillips *66* airplane lubricants. For dependable aviation products, think first of Phillips. The Aviation Department, Phillips Petroleum Company, Bartlesville, Oklahoma.



Luxury-loving orchids arrive in the pink of condition after fast, comfortable coast-to-coast trip via Slick Airways. Pressurized cabin and controlled temperature preserve freshness.

Phillips 66

AVIATION PRODUCTS

AIR Report

Significant Trends and News

FIXED-BASE OPERATORS OF THE NATION WILL ATTEMPT TO DRAFT REALISTIC AIRMEN TRAINING PROGRAMS during the National Aviation Trades Association annual convention at Hotel Texas, Fort Worth, November 13-16. All operators are invited to attend regardless of NATA membership.

CRITICAL MATERIALS FOR NEW-PRODUCTION CIVILIAN AIRPLANES, both carrier and non-carrier types, are now being allocated by DPA in accordance with CAA-CAB claimant agencies justifications. Because the civil program is so small in comparison to the military program, computations and requirements are easily figured. Principal allocation troubles are in the military program which includes products on the Controlled Materials Program "A" and "B" lists. It now appears that the civil non-carrier program of 3,500 units annually is secure, with more and more top Washington officials recognizing the advisability of continued and orderly civil aircraft production.

FIRST AERO COMMANDER DELIVERY is expected to be made during November following CAA certification of the production model as a modification of the prototype, which was certificated some time ago. The Chicago "Tribune," whose publisher has used private planes for three decades, will receive the first delivery. Metal Products Division of Thompson Products at Indianapolis, Indiana, will receive the second delivery. Sales Manager Carl Wootten reports increasing foreign orders and interest in the Aero Commander. A Mexican construction business will receive Nos. 7 and 14, a Brazilian coffee planter and rancher will receive No. 49, the Iranian government's transportation department will receive No. [illegible], and the Freiberg Mahogany Co., of Belize, British Honduras, will receive No. 51.

TWIN-ENGINE TURBOPROP TRAINERS patterned after Convair's pressurized 340 commercial transport will be produced in limited numbers for the USAF.

ADDITIONAL STEEL FOR AIRPORT CONSTRUCTION will be authorized in the 1st quarter of 1952, according to the CAA, which was to issue authorizations for new construction by November 1.

DE HAVILLAND COMET JET AIRLINER, flew from London to Singapore, or 7,748 miles, in 19 hours and 8 minutes of flying time.

HIGH INTENSITY LIGHTING will be installed at the Miami International Airport. The system is supplied by the Line Material Company and will be installed on the new 9,400-foot runway and an 8,400-foot runway, together with the taxiway system.

A PLANE COMBINED WITH A HELICOPTER and called the "helidyne" has been developed by the Gyrodyne Company of St. James, N. Y. The craft has been extensively tested and performance includes vertical lift from the rotor, power being gradually transferred to a propeller, and lift then being transmitted to the conventional wings. Gross weight is 12,800 pounds and top speed is 170 mph.

AVRO CANADA has closed its New York office and production plans have been deferred for the Avro Jetliner, due to military commitments.

TEN-FOLD EXPANSION OF ROCKET MOTORS has been announced by Ryan. Ryan previously built the motors for Douglas, will expand output for Firestone. Five Ryan L-17 liaison planes are being used for the Royal Hellenic Air Force for communications and reconnaissance.

The sixth and last Navion Clinic of the year has been launched by the Ryan Company. Curtailment of civilian craft production has made this maintenance service to Navion owners doubly important.

ALUMINUM PRODUCTION has been largely restored in the Pacific Northwest in Alcoa's facilities since rains broke the drouth and power returned.

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FLIGHT MAGAZINE

Including SOUTHERN FLIGHT and MODERN AIRPORTS

NOVEMBER, 1951 VOL. 36, No. 5

COVER: Piper's 4-place Pacer and Tri-Pacer models are outselling the Cub factory's 2-pl. trainers. During the period January-September, 1951, Piper delivered 520 Pacers and 409 trainers.

—(Piper Photo.)

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Just

Incomparable

a pretty girl

She's thankful for the drumstick. We're thankful for girls like Winona Cox, 23, with hazel eyes and brown hair. When she isn't working for an electrical company, Winona spends her time golfing, swimming, and dancing. (No. 2 in a series of pretty Dallas girls discovered and photographed especially for Southwest Airmotive).

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Executive Airplane Interior
By Southwest Airmotive.

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Just among ourselves

EDITORIALS

BUTTER AND GUNS ON AIRPORTS

THE 1951 Conference on Airport Management and Operations last month in Norman, Oklahoma, sponsored jointly by this publication and the University of Oklahoma in cooperation with the CAA, brought into sharp focus the many serious problems involved in military aviation's reactivation of World War II fields that were taken over by muncipalities and operated as civilian airports, and also the problems that arise in joint civil-military use of pure municipal fields. From the spirited discussions at the Conference both by military spokesmen and operator-managers of the civil airports, one might get the idea that all is trouble and confusion, and that practical solution is nigh on to impossible in some cases.

But we've come to the conclusion that the problem is not as insoluble as some people make out. There are, of course, extreme cases where specialized types of operations will simply not permit joint use of airport facilities and the field must be either strictly military or completely commercial. In a "butter and guns" economy—a time when the military must expand with the least possible disruption of normal commercial operations—it's simply a matter of give-and-take and the exercise of sound judgment by both military commands and the civilian owners-operators.

We recently bumped into a case where such judgment was employed to the satisfaction of all concerned—the military, the commercial operators and the public. At Wichita Falls, Texas, the U. S. Air Force has moved back into Sheppard Field some 40,000 strong with a mechanics training school. They have taken over the airport and are improving the runways, but leaving the West side of the field completely open to commercial and private air traffic and base operations.

Digging into the reasons for such cooperative spirit on all sides we found what we consider the key to the problem—a progressive community spirit on the part of the municipality, a commanding general who recognizes the importance of civil aviation, and an airport operator-lessee who, like the general, has been around for many years and simply knows what the score is. When you get a couple of old-timers in this business across a table from each other like General C. V. Haynes, the commanding general of Sheppard Air Force Base, and Fulcher (Army) Armstrong, the airport operator who's been there 24 years, plus a progressive leadership downtown, you're bound to make a deal. That's exactly what happened at Kell-Sheppard Field, the municipal airport at Wichita Falls.

Next time you see trouble developing from military expansion, somebody involved isn't being reasonable. Hard-headed, cantankerous cities or operators can be as obstructionist as eager-beaver, ignorant military officers with the Hitlerian complex.

We might as well face up to the fact that we're going to have to live together for a long time to come, both in the air and on the ground. Joint use of facilities can and must be be worked out by reasonable minds. If you don't think it's possible, just take a reading on the Wichita Falls experience.

PROGRESS WHERE SERVICE IS ESSENTIAL

AIRCRAFT radio communications and navigation for the private owner who uses his airplane for travel have scored spectacular strides in recent years through subminiaturization and electronic marvels. The miracles of VHF radio and similar aircraft equipment are far better than anything available ten years ago and practically everybody who uses an airplane for transportation now has excellent radio equipment and wouldn't fly without it.

This transition has not only made flying more practical and dependable but has established aircraft radio servicing as a valuable, business-like branch of civil aviation. Where practically anybody with a pair of snippers and a soldering iron formerly "fixed" an ailing aircraft radio, today's radio serviceman is either a specialist or a failure. Those who have demonstrated that they are competent specialists are rapidly becoming highly successful businessmen, so great is the demand for good workmanship in aircraft radio servicing.

A considerable number of the leaders are Lear distributors and their technicians, for Lear has become more and more a factor in aviation utilization through a process of constantly improving and developing its equipment. The latest Lear success of considerable proportions in civil aviation is the L-2 autopilot, light enough and low enough in cost to be useful to large numbers of airplane owners. So many L-2's are going into lightplanes that Lear aircraft product distributors in 55 cities now offer L-2 autopilot installations and servicing. We know many of these radio shops and they are all outstanding establishments. We also know of some of the requirements for successful L-2 installations and servicing and in observing them have noted a commendable interest on behalf of the Lear factory and Bill Lear himself in seeing that the user of an L-2 is completely satisfied.

We believe Lear deserves being singled out in this regard for recognition of its achievements in the interest of those who buy and use Lear equipment for better flying, and we think the Lear organization with its distributors and servicemen deserve the

(Continued on page 40)

POWER BY PARACHUTE

Mountains may block the infantry, rivers may stall the tanks, mud may bog down the artillery . . . but as long as planes can fly, our paratroop army can throw its Sunday punch into battle. Divisions of men and their heavy equipment float safely to earth and less than 15 minutes after the first chute opens, the big guns start firing. Power lands by parachute to wallop the enemy where it hurts most.

For years, the Pioneer Parachute Company has worked in cooperation with our Armed Forces to design, develop, test and manufacture parachutes that are strong enough, large enough, accurate enough to do the job with precision performance. That's why Pioneer Parachutes are found in vast numbers on every "sky front" of battle . . . FIRST in the Vanguard of attack!

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preaching "limited instruments" for us—the average pilot in single engine

trimmed the airplane out to where it was descending at a reasonable rate

said, "Now, are there any airplanes in your vicinity?" Naturally, I

Through flying, a new world opened up to me. Thanks to my airplane, I have a radius of action in oil and real estate interests covering about 2,000 miles.
—(FLIGHT MAGAZINE Photo by Tom W. Collins.)

Call Me Conservative

How a retired surgeon feels about flying in marginal weather conditions

By DR. E. O. RUSHING

HERE I am knocking on sixty years of age with my share of logged hours after learning to fly four years ago, and there's one thing I can't figure out—the appalling number of folks who insist on sticking their necks out, especially in weather. I do find solace in the fact that flying, safe flying that is, has become an old man's game with most of the people who have the money to buy and use an airplane in the 40-years or better age bracket and with the best safety record. But even though most accidents are in the younger age groups —products of inexperience and bad instruction in my opinion—you still find supposedly intelligent pilots barging into weather, trying to climb through and let down in low overcasts and going into busy terminals without radio—and making the headlines that retard aviation progress more than any other one factor.

Pilots, Not Editors, Make News

Remember this always—it's not the newspapers that make those headlines. Who does? People like you and me! Ordinary pilots who get a few hundred hours under their belts and discover, as I did, the comfort, convenience and utility of the modern airplane and wonder why someone hadn't told them about all this before. Maybe the engineers are giving us airplanes so easy to fly some of us think we can do anything with them. I don't know. But I do recognize a lot of people now

When I cut the switch at Minneapolis, I prayed long and diligently for forgiveness, promising never to do it again. That was the end of my desire to fly instruments.
—(FLIGHT MAGAZINE Photo by Tom W. Collins.)

preaching "limited instruments" for us—the average pilot in single engine airplanes. It's dangerous talk. Personally I can't complain about my four weather delays in four years of flying which caused me to break business engagements I desperately wanted to fill.

Not to say that I wasn't at one time interested in barging through weather and getting mixed up in what they call "marginal" flying, because I was. One day I decided to talk it over with my instructor and my ears still burn from the blast I got. He said, "Doc, would you let a first-year medical student do serious surgery in your hospital?" "Of course not," I replied, "but I'm talking about limited use in this situation." He said, "You're also talking about limited ability, aren't you? Did you ever hear of anybody being slightly pregnant? You can't out-guess the elements — the weather, to be exact — and don't you start trying. Furthermore, I think you are about ripe for a demonstration. Let's you and me go up."

We went up about 5,000 feet and I donned the blinkers that were placed over my head. Then he said, "O. K.— let me see you fly straight and level." Then he said, "Climb 500 feet; let down 500 feet; keep your airspeed constant; watch this; watch that; look out here; look out there." Needless to say, I got a quick demonstration of what I did not know and was unable to do. Then he said, "Now, I'm going to show you something." He put the gear down, reduced the power and trimmed the airplane out to where it was descending at a reasonable rate with 85 or 90 miles per hour indicated air speed. He said, "Now, you see the airplane is doing a better job than you did, with no help at all; but let's watch a short while." We soon hit some turbulence and the wing went down, then we picked up a little speed. He quickly corrected that with a touch of the controls and said, "That's what you were unable to do, simply because you didn't know how. Had you made the correction you no doubt would have aggravated the situation; and had we proceeded with no correction, possibly a little trouble might have developed."

Another thousand feet of this and he put the blinkers back on me and said, "Now, are there any airplanes in your vicinity?" Naturally, I couldn't see and I didn't know. He said, "Do you suppose there is a possibility of colliding with any non-scheduled or scheduled instrument flights through this area?" I immediately visualized what would happen if I ran into an airliner, or one ran into me, or even a private airplane with no flight plan and no assigned altitude. I began to get the idea.

My instructor said, "O. K., take off the goggles." We were on solid instruments. I almost blew a fuse. Then he asked me, "Exactly where are we? How high is the ground under us? How low is the overcast? Does it go completely to the ground? Is your al-

(Continued on page 38)

I expect to keep on flying. By practicing turns and stalls once a month and by coming in out of the rain and by going to bed when it gets dark, some day I'll be able to part my long, white beard to find the wheel and throttle.
—(FLIGHT MAGAZINE Photo.)

all DC-3 operations came as quite an

HELICOPTERS IN THE HEADLINES

Lightplanes on the Airline

Dependable Bonanza performance built Central Airlines into a DC-3 operation

By TOM ASHLEY

FOUR-PLACE small planes have now been replaced by 24-passenger DC-3 transports on Central Airlines but the 14 months it operated the lightplanes exclusively and the 7 additional months of combined operations with DC-3's offer some interesting facts on the modern lightplane's usefulness, economy, dependability and performance. The record is also historical, for Central was the first so-called "feeder" airline to carry passengers and mail in small, single-engine planes. Experimental from the start as a test of small-town air service with small planes restricted to daylight contact flight, the operation made it possible for Central Airlines literally to "grow up" to DC-3 stature from a small and modest beginning.

A fleet of 11 Beechcraft A-35 Bonanzas launched the experiment. The use of these "off-the-shelf" airplanes permitted Central Airlines to finance its initial operation at about one-fourth the cost of starting with DC-3's, according to the airline. Coming in mid-1949, when airline financing was difficult throughout the air transport industry, this actually amounted to the difference between operating and not operating. But the Bonanza fleet was practical of attainment and simplified the start of operations at the end of August, 1949.

Would the traveling public patronize a small-plane airline? Revenue passengers totaling 56 for the first month of operations (September) numbered 123 for the second month, 346 for the third month, 420 for the sixth month and 941 for the eighth month. During the 21 months they were operated, Central's Bonanzas carried 11,536 revenue passengers a total of 1,295,000 revenue passenger miles plus 20,560 ton miles of U. S. mail.

This traffic development was proof that there was business for the airlines in the cities and towns it was serving. It was also proof that the small planes could generate passenger and mail volume.

But about the time this was being proved, something else became apparent. After reaching a volume of 1,132 passengers for its 9th month of operations, the lightplane airline's passenger traffic leveled off and stayed between 1,000 and 1,150 passengers per month for six consecutive months, being May-October, 1950.

There was a reason—Central believed it had reached the Bonanza's physical carrying capacity for schedules having frequent stops over linear routes such as it was operating. For example, when 1,138 passengers were carried in August, at least 96 known reservation requests had to be denied because full loads between mid-points were blocking off or preventing sales to more distant points. Also, it was learned that mail and baggage together were frequently limiting passenger capacity, disappointing passengers already waiting at the airports.

The answer was immediate steps to replace Bonanzas with DC-3's on about half of Central's system by mid-November, 1950, and by switching completely to DC-3's by mid-May, 1951. With DC-3's in operation, revenue passengers quadrupled, numbering 2,445 for May, 3,109 for June, 3,738 for July and 4,043 for August. This build-up to a 4,000-passenger month only about 115 days after the start of

Eleven Bonanzas like this one were flown a total of 17,182 hrs. in establishing Central Airlines before it went to DC-3's. They carried 11,536 revenue passengers and 20,560 ton-miles of U. S. mail. Fuel consumption averaged 9.62 gals. per hr.
—(Central Airlines Photo.)

all DC-3 operations came as quite an accomplishment in the local air service industry. For it, Central and the CAB could give considerable credit to the effectiveness of the small Bonanzas in launching the airline, even though the A-35's had now been replaced. The over-all cost in government mail pay to Central until it reached 4,000 passengers per month was about $1,300,000—well below the cost required in developing 5 other local air carriers to the same traffic level (8 of 19 local service carriers had not yet reached 4,000 passengers per month).

Operating costs of the Bonanzas before the DC-3 operations began to influence Central's financial and statistical reports to the CAB were as follows:

Flying Operations (pilots, fuel and oil, insurance), per mile	9.6c
Aircraft, Engine and Accessory Maintenance, per mile	4.5c
Depreciation (3-yr. basis; 10% residual value), per mile	2.4c
Total Operating Expense per mile	16.5c
Ground and Indirect Costs, per mile	22.8c
Total, per mile	39.3c

This cost of less than 40 cents per mile compares with 75.7c to $1.18 per mile for other local service airlines using multi-engine equipment in their first year of operations.

The impetus that Central gained with its Bonanzas permitted it to go from ¾ths of a passenger per mile in its last month of all-Bonanza operations to 2-1/6th passengers per mile in the first month of DC-3 operations and thence to 5 passengers per mile in its sixth month of DC-3 operations (21st month since beginning operations). Central says this figure exceeds the accomplishment of nearly half the local service airlines in a similar period of time and at approximately half the cost to the government on a per-mile basis.

Here are some interesting figures on performance as recorded by Central for its fleet of 11 Bonanzas during 21 months of scheduled airline operation:

Miles flown totalled 2,505,202, logging some 17,182 hours flown. This is a lot of flying when it is considered that the average distance between stops was 51.8 miles along Central's 1,301 unduplicated route miles at the time. In averaging out speed, the Bonanzas are credited by Central with 145.8 mph. on the basis of "air borne hours"—wheels off to wheels on. This, incidentally, compares with Central's aver-

(Continued on page 42)

HELICOPTERS IN THE HEADLINES

HELICOPTERS in war and peaceful pursuits are producing a continuous stream of reports describing rotary-wing versatility. Although scores of applications have long been discussed in print and accomplished in the field, the utilization of helicopters is still largely exploratory and each month brings new examples of their remarkable and often spectacular performance as machines of work. Just this month, for example, Sikorosky Aircraft Division of United Aircraft Corporation reported the following:

Recently a battalion of about 1,000 First Marines was landed at the front on a mountain top opposite the guns of the Reds in Korea. The operation, using HRS Sikorskys, took only six and one-quarter hours—as against two days by foot which entailed severe fatigue. The craft hovered while the Leathernecks climbed down knotted ropes. The first landing party at once cleared two 25-foot squares for subsequent landings. In addition, nine tons of supplies were landed to support the troops, and the same 'copters were used in wire-laying for communications.

★ ★ ★

Approximately five thousand United Nations soldiers have been rescued or evacuated in Korea by helicopter since the war started.

★ ★ ★

One of the helicopters' astonishing records has been in quick movement of the wounded or rushing specialists to them, which has been of great importance in neurosurgical cases. In head or spinal wounds, chances of infection are great. Death or paralysis was too often the result of a lapse of time. By rapid transportation afforded by helicopters, the percentage of men arriving back in Japan with infected head and spinal wounds has dropped from 42 per cent to 2 per cent.

★ ★ ★

Two 3rd Air Rescue Helicopter pilots have established a record of saving 427 fighting men. Capt. Lynden E. Thomason, of Paradise, Calif., awarded the Silver Star, holds the world's record of having rescued 224 men in 124 missions; Lt. Elmer L. Barnes of Crossroads, N. M., flew 111 missions and saved the lives of 203 wounded. Lt. Barnes was shot down by enemy fire. Both men will instruct in a military 'copter course at San Marcos, Texas.

★ ★ ★

The Army has announced qualifications for two courses in helicopter flight training. For the Transport Pilot Training Course, applicant must be between the ages of 20½ and 30; he must complete basic training in the Army and hold a valid CAA private pilot's license. The Army Flight Training Course requires a man 30 or under and with a commission no higher than first lieutenant. First phase of this training is given at San Marcos, Texas, which will be skipped if applicant holds a private license and has logged more than 60 solo hours of which 5 hours were in the six-month period previous to application. Transitional course in rotary-wing training will follow.

★ ★ ★

Recently an employe of the Canal Department was rescued from the dense jungles of Panama when bitten by a deadly fer-de-lance snake. Cornelius Pennycott was working at a hydrographic station on the Chagres River when attacked. He was still able to call his headquarters, which immediately dispatched a helicopter from the First Air Rescue Squadron, Albrook AFB, C. A. Capt. John F. Miller, accompanied by Capt. Glenn B. Doan, a surgeon, landed the craft in the river in six inches of water. They swam the alligator-infested river to the shore

(Continued on page 41)

THOSE REMARKABLE BELLS

OVER 3,000 casualties were evacuated by Bell Aircraft helicopters serving with Army, Marines and Air Force in Korea during January-September, 1951. . . . One of the units alone, the Second Helicopter Detachment attached to the 8th Army in Korea, rescued 1,014 seriously wounded fighting men in 7 months—using only four Model H-13D Bell helicopters. . . . One of the Second's pilots, 1st Lt. Joseph L. Bowler of Haven, Pa., holds the unofficial individual evacuation title. Known as "Joe With the Red Cap," Bowler has personally saved 513 casualties, many of whom he picked up in his Bell under heavy communist fire. . . . Three of the Second's "mechanized angels" have been hit by enemy fire and one is still flying with its plastic bubble cabin perforated from bullets—it drips when it rains. . . . All four pilots of the Second Detachment have Distinguished Flying Crosses for their 'copter exploits and have evacuated U. S., British, Canadian, French, Belgian, Dutch, Filipino, Siamese, South Korean and Turk casualties. . . . Medic reports state 98 per cent of all helicopter-evacuated casualties survive their wounds. ★ ★ ★

Defense Zone Requirements for Airmen Who Travel

THE CAA has named four new Air Defense Identification Zones (ADIZ) and has changed boundaries of existing domestic zones. All pilots who fly in ADIZ areas must file flight plans, make position reports, and comply with current regulations or face prosecution.

There is one important exception to the flight plan and position reporting requirement which applies to domestic ADIZ flights only. Flight plans and reports are not required on VFR flights which are confined to altitudes of less than 4,000 feet above the immediate terrain.

In addition to this automatic exception, the CAA may waive the flight plan and reporting procedures for VFR flights under certain conditions set forth in CAR Part 620.13.

IFR Flights

The filing of flight plans and making of position reports under IFR is conducted as in the past, and the pilot will meet all ADIZ requirements by following standard IFR procedures, described in Part 60 of the Civil Air Regulations. Flight plans must be filed, however, for off-airways as well as on-airways IFR flights.

DVFR Flight Plans

With the exception of low-altitude flight mentioned earlier, pilots must be equipped with two-way radio when flying within an ADIZ. This requirement applies regardless of altitude for flights entering a coastal or international boundary ADIZ.

When a Defense Visual Rule Flight Plan is required, it shall include the estimated time, position and altitude at which the flight will penetrate the ADIZ. As an alternate, it may include the time, position, and altitude at which the aircraft passed the last reporting point prior to penetration of an ADIZ and its estimated time over the next reporting point in its path.

If a pilot complies with the DVFR requirements listed, he is not required to make additional position reports, unless his previously filed estimate appears to be in error by more than five minutes or 20 miles. Under such circumstances, he shall file a corrected estimate with an appropriate aeronautical facility.

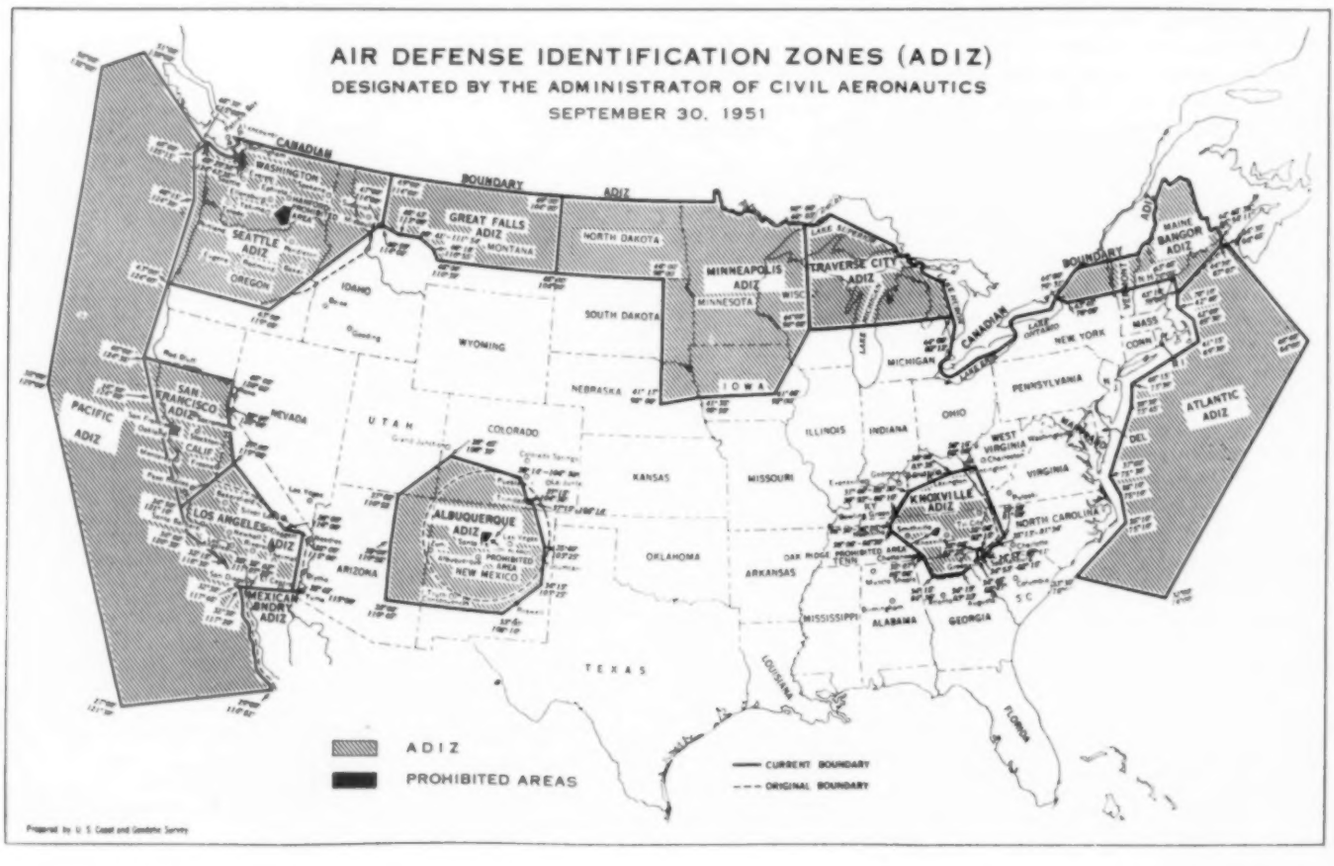
The pilot shall not deviate from his DVFR flight plan unless he gives prior notification. He may commence his descent within 20 miles of his destination, however, without reporting change of altitude.

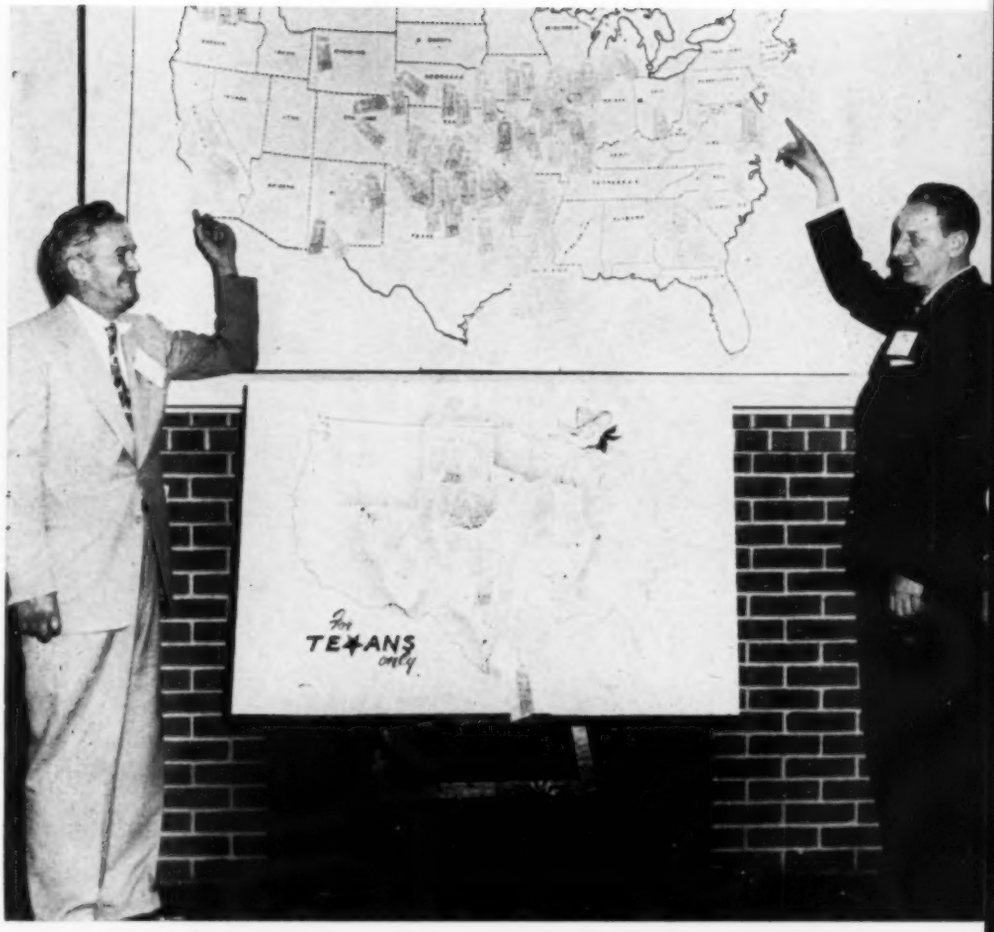
Radio Failure

In case of radio failure on IFR flight, the pilot shall follow the normal IFR procedure described in Part 60 of the Civil Air Regulations.

If radio failure occurs on a DVFR flight, the pilot may proceed in accordance with his original DVFR flight plan. As soon as possible, how-

(Continued on page 41)





George McSherry, superintendent of New York's International Airport, and Clarence M. Shy, Stockton (California) director of aeronautics, argue in the picture on who traveled the greatest distance to attend the 1951 Conference on Airport Management and Operations last month at the University of Oklahoma. That's McSherry on the right. Tags on the map represent home states of each registrant at the first day of the meeting. A tabulation of public airport investment represented by the conferees totalled over $500,000,000.

Getting the Job Done

AIRPORT managers and operators from some 30 states, whose airport properties represent one-half billion dollars of public investment, flocked into the University of Oklahoma's campus last month for the third consecutive short course on current airport management problems sponsored by the University and FLIGHT MAGAZINE with the cooperation of the Civil Aeronautics Administration.

The OU Campus is not only warmly hospitable but affords a unique and most ideal geographical location for a productive meeting. The Extension Study Center under the able guidance of John Freeman, a Conference co-chairman, is right on the University's fine airport, with housing, eating facilities and meeting rooms all in the same building. Such an environment and physical layout is conducive to full attendance at Conference sessions, with hotel bars or other diversions *in absentia*. This annual event is noted for attracting conferees who are intent on contributing to and getting something out of the program. The Conference belongs to them—not to the sponsors—and for that reason it has a growing reputation and a distinct flavor all its own. Its fundamental concept of getting down to basics is best illustrated by its location on an airport.

Each year the Conference publishes a verbatim copy of its proceedings as a permanent reference book for those in attendance. Past proceedings also have been widely used by municipal, state and Federal authorities as a guide to airport policies, with considerable influence on shaping official thinking and attitudes on problems of the moment in every phase of airport management and development. So it would be redundant to detail all the brilliant papers and lively discussion sessions in these columns. A moderate number of extra copies of the proceedings will be available from the University.

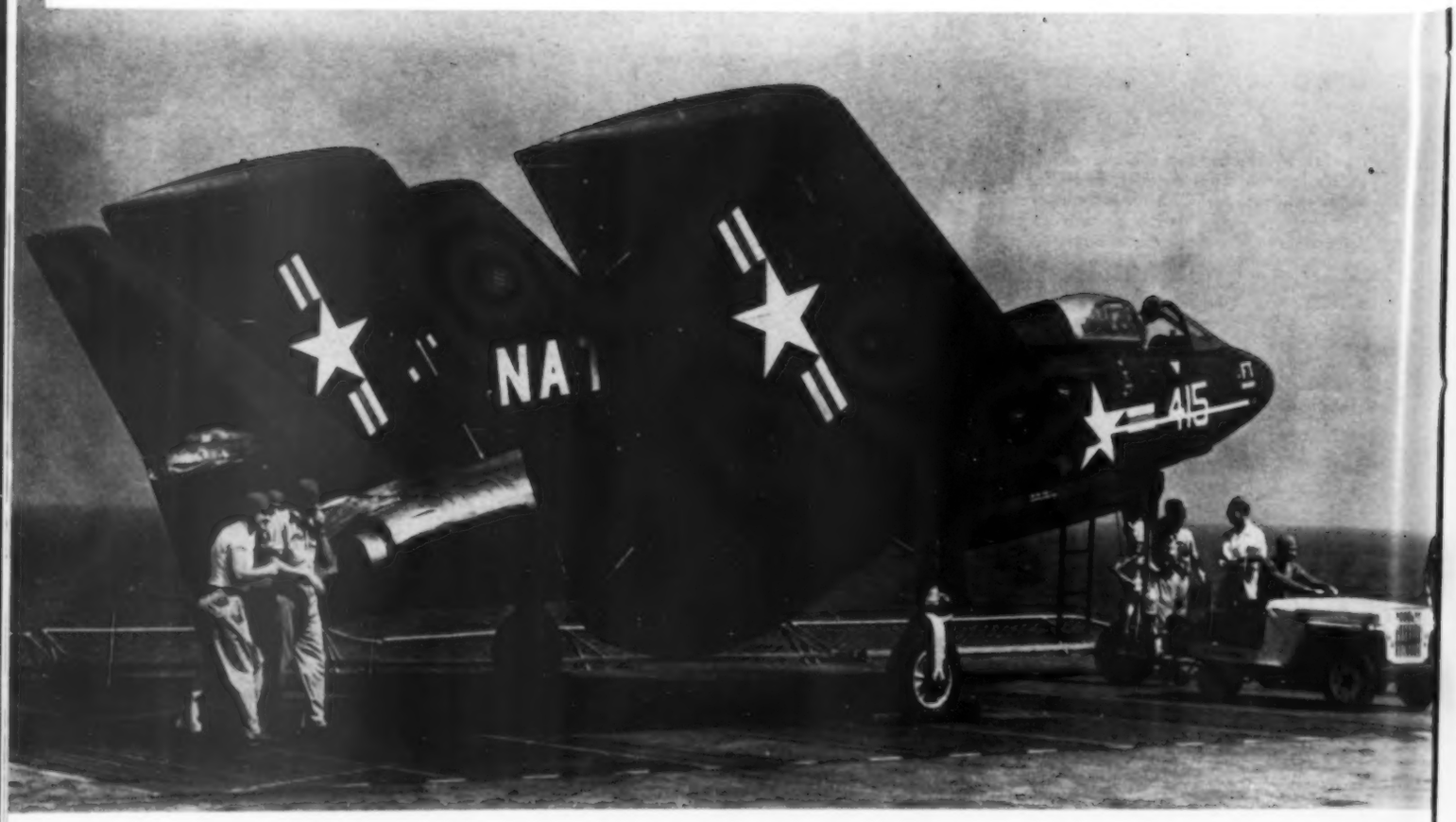
The 1951 Conference established for the first time a "Board of Inquiry" which thoroughly explored a major subject of wide interest. So successful was this year's topic on military re-activation of former surplus airports, next year's Conference will provide another one of comparative interest and timeliness. Testimony by airport managers revealed instances of repeated surveys on the same airport by military teams apparently in open competition for choice locations. A touch of choler appeared to tinge the testimony of witnesses who recited their experiences in loss of revenues and use, uncertainty of future operations and improvement programs arising from the general confusion and the storm of rumors caused by repeated survey teams.

U. S. Air Force Brig. General H. R. Maddux spoke at length and characterized as so much malarky the rumors connected with Air Force plans for the use of airports. He stated that his office had been created to minimize such conflicts and troubles as expounded by the airport managers and city officials. The Conference voted to send a transcript of the arguments to high ranking civil and military officials in Washington, including members of the Air Coordinating Committee.

One of the most sweeping and revolutionary proposals ever propounded for the overhaul of regulations and practices affecting general aviation (as distinct from military, manufacturing and air-carrier aviation) was detailed in a charge of 46 specific recommendations by John Burke, owner-operator of Wiley Post Airport, Oklahoma City, and a member of the CAA's Airports Advisory Committee. This group adopted the Burke resolutions after an independent study-survey of general aviation by the University of Oklahoma.

The galaxy of well-known speakers and their subjects included: Walter Betsworth, manager, Waterloo (Iowa) Municipal Airport, "The Day of the Little Field"; Dwane L. Wallace, president, Cessna Aircraft Company, Wichita, Kansas, "The Fight to Preserve Civil Aviation"; Norbert S.

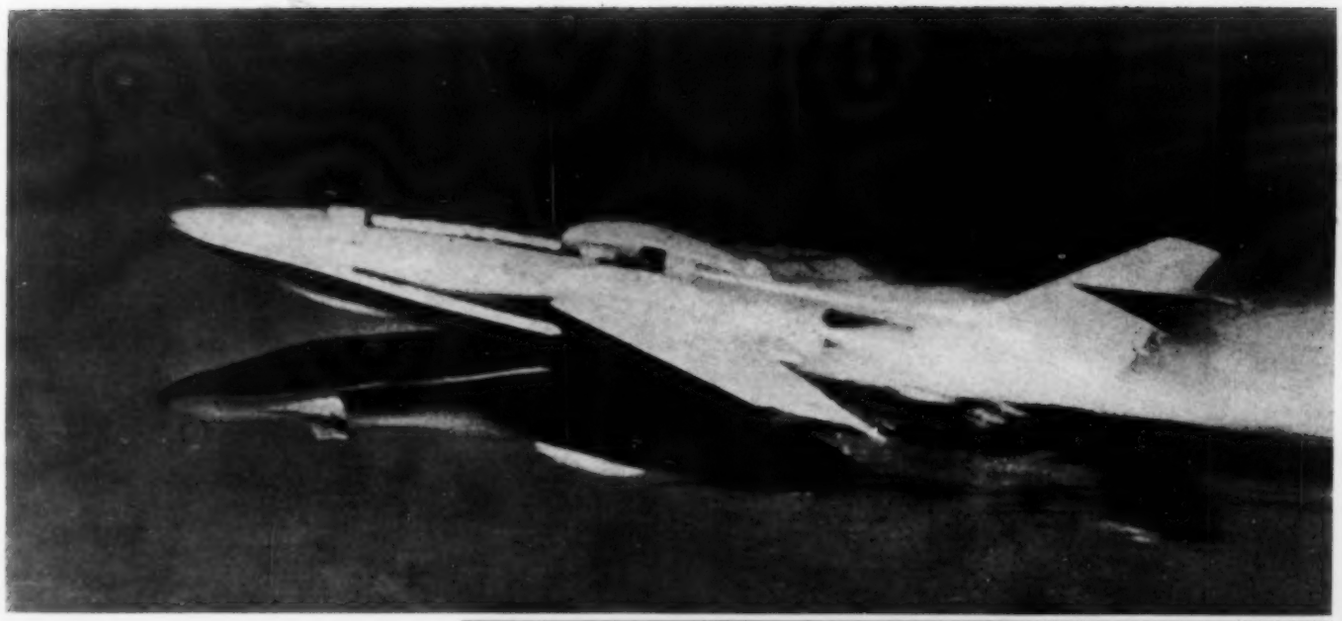
(Continued on page 32)

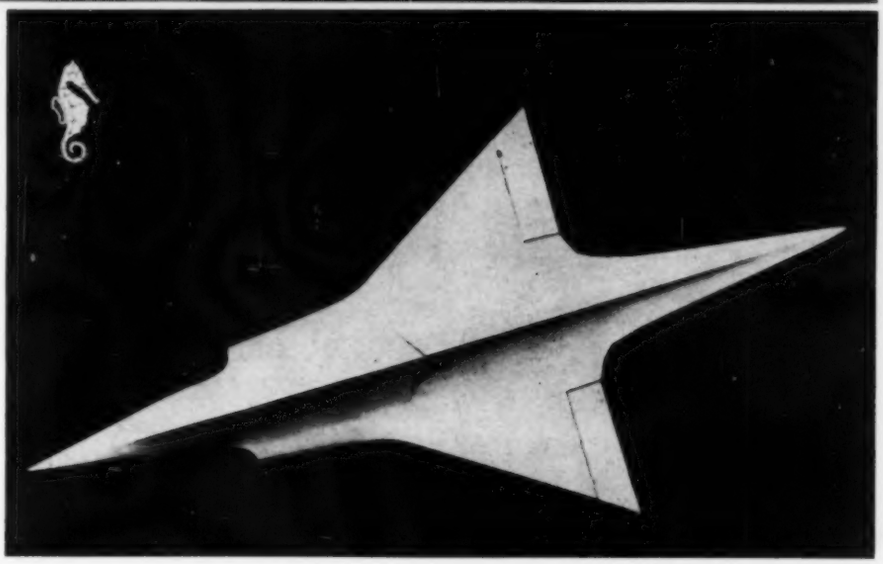


FIRST PHOTOS OF F7U CUTLASS IN CARRIER OPERATIONS AT SEA have been released by Chance Vought Aircraft and the Navy. With wings shown above for first time in a folded position, Cutlass is seen being towed into position from deck elevator. In take-off and landing photos below, note extreme nose-high attitude of the radical fighter, which combines elevators and ailerons. Take-off appears to be from catapult launching. In landing scene, arresting hook has caught No. 2 cable in very slow and precise landing. Photos were made aboard USS Midway during initial carrier qualification tests and evaluation exercises. F7U is twin-jet and first production airplane designed for after-burners. One of America's fastest production-model airplanes, it is a rapid-climbing interceptor-fighter with pressurized cockpit for high altitude operations. Performance and many of its details have not been released. Chance Vought is producing the Cutlass in Dallas, will add 3,000 employes for an increase ordered in its production.

—(Navy Photos from Chance Vought.)

flight pictorial



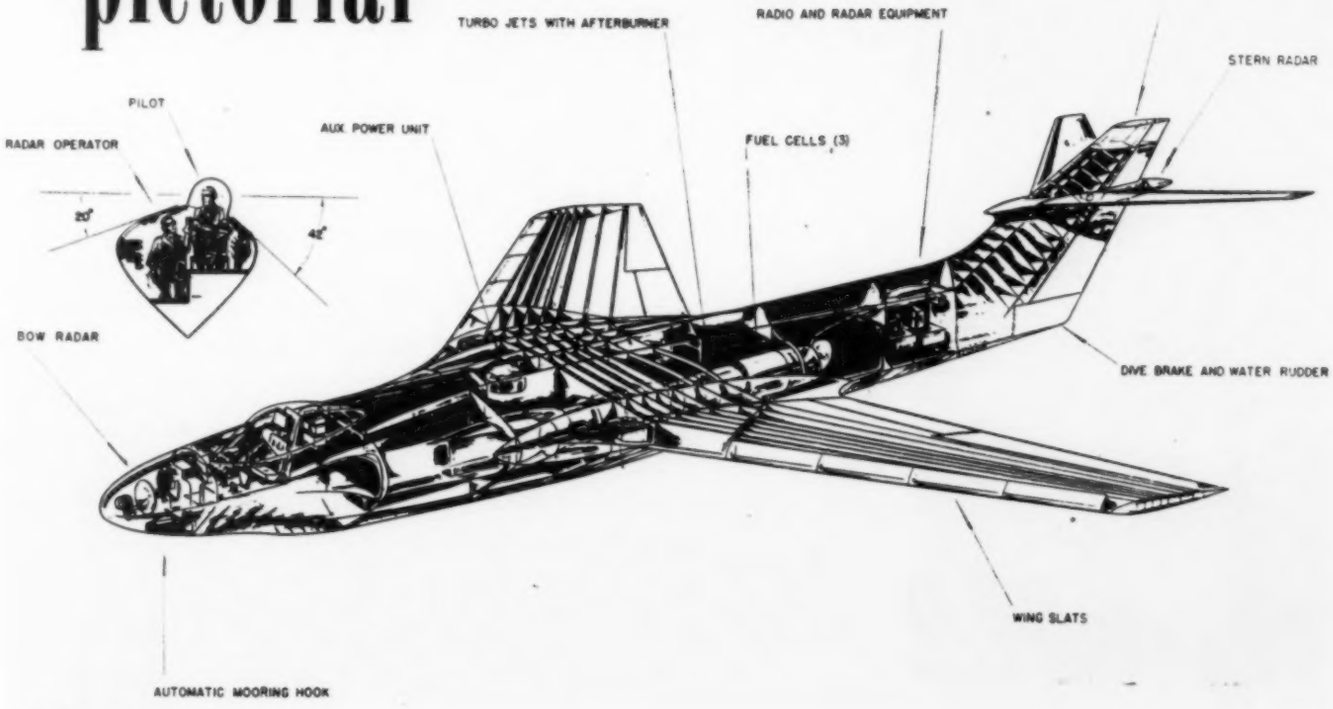


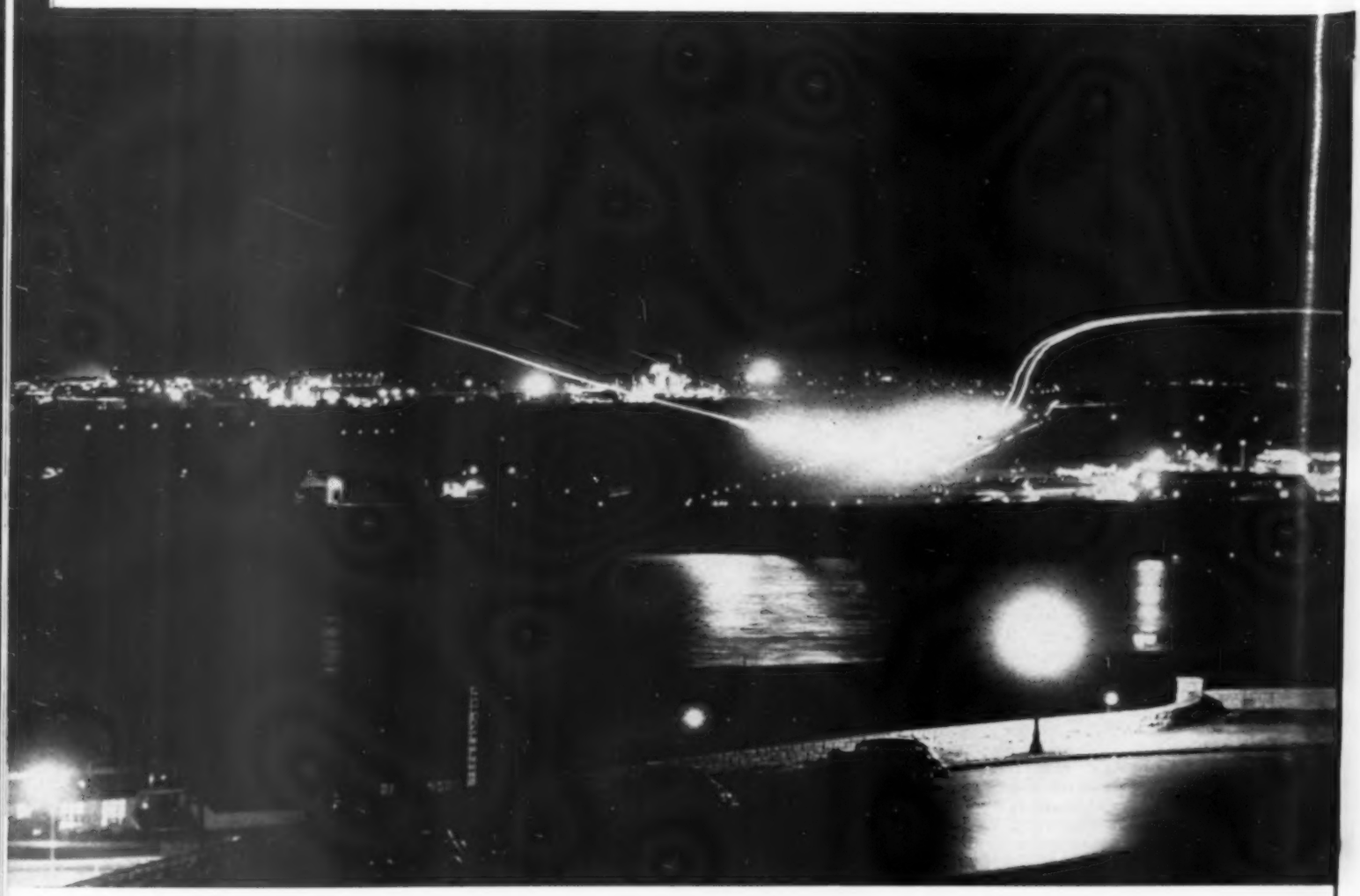
PLASTIC TIP ANTENNA

SUPERSONIC WATER-BASED AIRCRAFT designs under development by Convair incorporate blended-wing-and-hull configuration. Craft above is a small dynamically-similar radio-controlled free-flying model powered by tiny pulse-jet engines. At right is another Convair "skate" model as viewed from the bottom. Sketch below illustrates internal arrangement, with inset showing cross-section of cockpit housing pilot in a bubble and radar observer. "V" bottom and low center of gravity are said to give craft excellent ship stability without wing floats.

—(Convair Photos and Sketch.)

flight pictorial





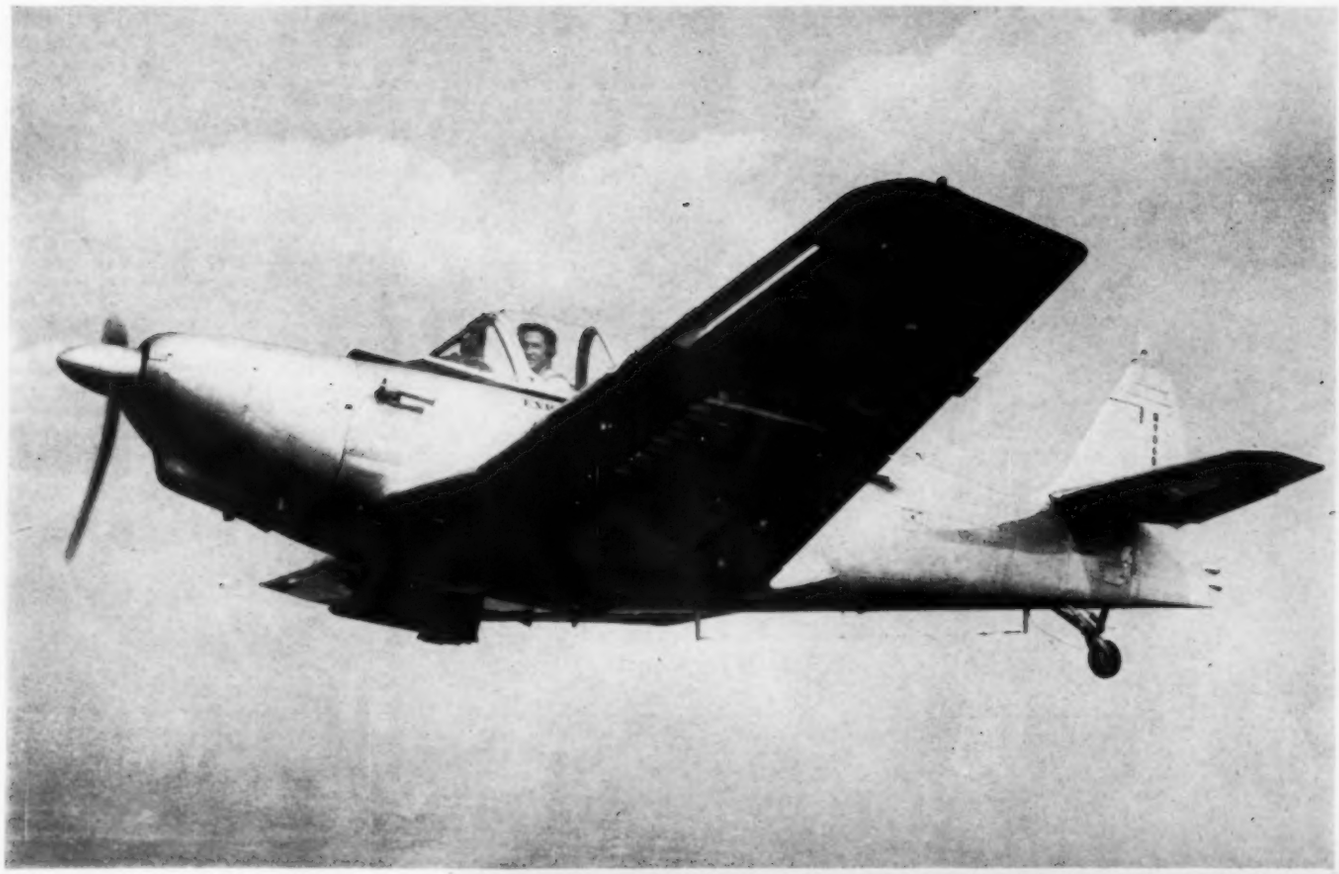
DEPARTING AND ARRIVING TRAFFIC is clearly traced in this unusual photo showing night operations at Kansas City Municipal Airport. Taken from a park on the South side of the Missouri River about half way up the bluffs, the scene looks down the North-South runway. Solid lines of landing lights at far end of runway are framed by the dots of the aircraft's navigation lights. Intermittent line tracings at left were made by navigation lights of departing aircraft climbing away from the runway. Two hangars to left of the runway are those of the Kansas City Flying Service and Art Goebel's old flying school, while the brightly-lighted ramp to the right marks TWA's plant.

—(FLIGHT MAGAZINE Photo.)

flight pictorial

EASY DOES IT AS OVERHEAD CRANES LOWER SUPER CONSTELLATION FUSELAGE into a cradle where it will be nested while wings, landing gear, engines and interior fitfings are installed. Super Connie fuselage measures 113 ft. 7 ins. from nose to tail. Wheels visible are temporary rig used in towing ship from sub-assembly site quarter-mile away. Lockheed at Burbank is busy turning out 68 of the Supers for airlines and more for military services. With passenger capacity up to 88, the new Connies are constructed to take turboprop engines as these become available, with a promised performance of 400 mph. under jet power.

—(Lockheed Photo.)



INTERESTING CONVERSIONS which might become more familiar sights in the future are the Temco Buckaroo trainer equipped with machine guns and rockets (above) and the 2-pl. Temco TF-51 trainer at right. Note 2.75-in. rockets under wing of the Buckaroo. Firing tests are said by Temco to have indicated exceptional accuracy with the rockets, 10 of which are carried. Temco says Buckaroo target-marking could prove valuable to Army field commanders. Tactic would be for Buckaroo while cruising at 130 mph. to spot well-hidden ground concentrations and then "peel off in a 230-mph. dive to fire smoke-filled rockets accurately into target, meanwhile firing machine guns to keep enemy heads down and then use the dive's excess speed in maneuvering away from the target while the jets come in with an accurately-marked target to shoot at." Buckaroo is a 165-hp., 2-pl. tandem trainer developed from the Temco Swift but incorporating many significant changes. Like that shown at right, TF-51's are being delivered by Temco to USAF. Engineering changes converted them from North American F-51-D fighters into 2-pl. trainers with both cockpits under a single canopy but being full size and equipped with complete controls, instruments and radios for instruction and instrument training. Canopy is power-driven.

(Temco Photos.)

flight pictorial

A STRAP-ON HELICOPTER has been developed for the Navy by Rotor-Craft Corp. of Glendale, Calif., and is the world's first rocket-propelled 'copter. The machine weighs less than 100 pounds and carries one man, armament and liquid fuel. Its rotor-tip rocket engines are self-starting and display no giveaway flame at night. The rotor is attached to a steel tube which curves downward to support fuel tanks, a pilot's seat and cargo hook. A tube extending backward from the rotor hub carries a small rudder, and another extending forward and down is the pilot's control column. The pilot can use his feet only, or can attach small struts and wheels to the steel tube as landing gear. Performance is classified, but high rate of climb and power-off glide and vertical descent are claimed. Called "Pinwheel," it is undergoing military flight tests.
—(Rotor-Craft Sketch.)

flight pictorial

COMPASS ROSE at Cedar Rapids (Iowa) Municipal Airport is described by Manager Frank Hidinger as "looking simple but requiring much planning." Surveyors had first to find true North, using the North Star. Then six degrees East was plotted on the ground so that the concrete could be poured without moving these points. A threaded pipe was located at eight points of the compass and another in the exact center. Metal letters were placed in the wet concrete so they would be permanent. Special holders were made for insertion in the pipe. A 20-ft. pole is placed across the circle as shown so that a plane can be rolled up to the pole for accurate alignment and close-tolerance calibration of the aircraft's compass.
—(Cedar Rapids Airport Photo.)

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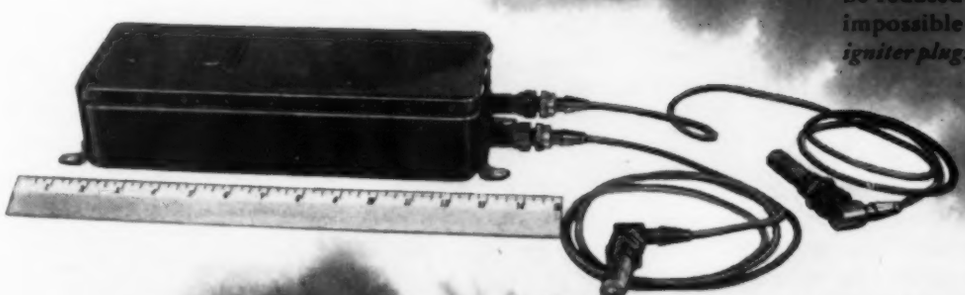

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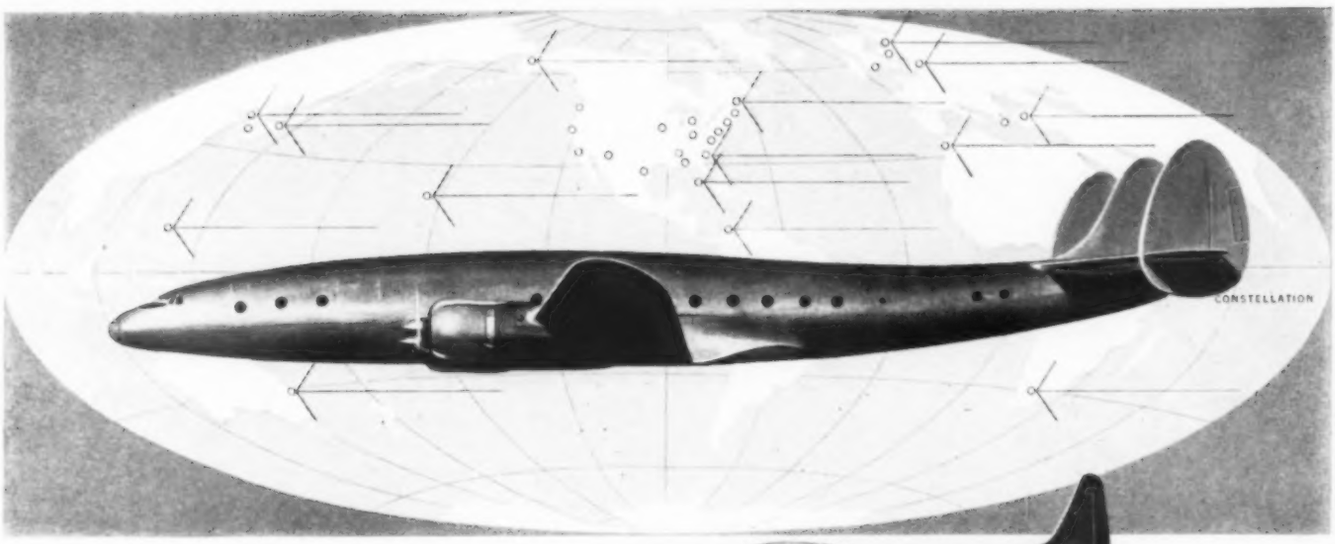
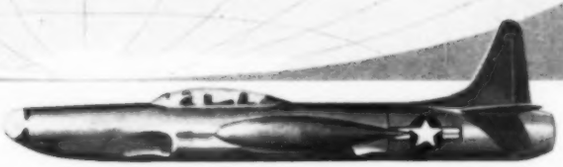
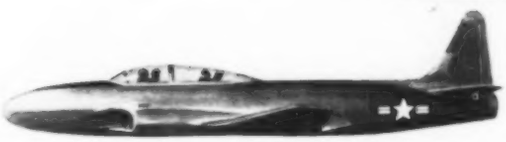
SNIFF!

Leadership demands constant achievement







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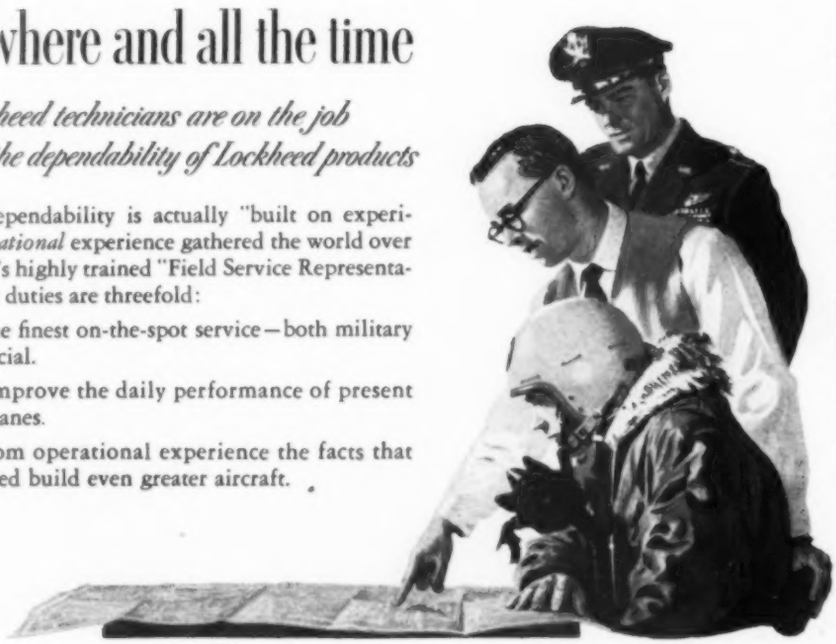

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CORSAIR V

Pilots got to complaining about alcohol fumes in the cockpit.

Bird-dogging Better Fighters

What happens when the Navy triggers a factory "fire drill"

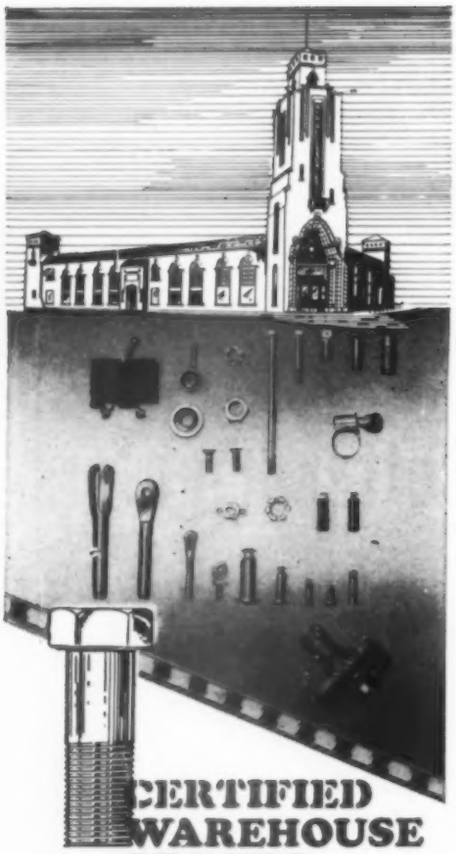
ANOTHER Winter brings on new and challenging problems to aircrafters supplying the fighting front in Korea, with emergency calls for specialization keeping airplane factories and suppliers on the alert. What happens on a hurry-up call from the armed forces is illustrated by a Navy triggering of a "fire drill" project assignment in the Chance Vought Aircraft plant at Dallas. The Navy wanted some F4U-5N Corsairs winterized pronto for Korea, with de-icing equipment for wings, tail surfaces, propellers and windshields. Since de-icing boots and the like had never been installed on a high-speed Navy fighter, the challenge was complete to Chance Vought engineers and their suppliers.

On Friday the order was received. On Saturday Chance Vought decided to tackle the job as a "line stopper" project, with priority over all other plant activity. A hastily-established schedule called for delivering 26 of the winterized Corsairs within 96 days. When it was all over, six had been delivered almost three weeks ahead of schedule, and all the rest had been delivered on schedule. But in the process a lot of headaches and ingenuity had gone into the project. How it all unfolded provides an interesting account of what aircraftsmen are frequently up against when the chips are down.

It started, logically enough, with a search of catalogs from suppliers by Henry Tereshkow, Corsair project engineer, who soon found himself talking about de-icing boots on the long-distance telephone to the B. F. Goodrich Rubber Co., in Akron, Ohio. The project was classified, which meant no telephone details. But Goodrich got the idea and put Tereshkow in touch with other people and in short order blueprints from Chance Vought brought de-icing boot proposals by air mail special delivery, Tereshkow meanwhile having rushed to Akron Sunday morning.

At a Monday morning conference with Goodrich engineers, it was decided the material needs could be met as far as Goodrich was concerned but a snag might develop in obtaining the mechanism to drive the system, manufactured by Eclipse Pioneer Division of Bendix at Teterboro, New Jersey. On the phone, Tereshkow arranged for a conference at the Eclipse Pioneer plant Wednesday morning to iron out the snag. But from Akron he flew to Hartford, Connecticut, where Johnny Lessner of Hamilton Standard had been alerted by telephone. No propeller anti-icing equipment difficulties were expected after the conference there.

In Teterboro the next morning, Eclipse Pioneer could do nothing at the moment more than to promise a 4-month delivery schedule on their components because of previous commitments. Armed with facts and figures detailing their problems, Tereshkow flew down to Washington where another Chance Vought troubleshooter, J. J Hospers, had been rushed and the two descended on the Bureau of Aeronautics and Captain Paul Ramsey. A lot of telephone calls between the Bureau and Eclipse Pioneer accomplished a reshuffling of orders and commitments on hand so that the Bendix components could sail through satisfactorily. Charles McIntyre of Bendix and Bill Tonge of Goodrich rushed to Dallas and practically lived with the plant crew. Naval activities



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were canvassed by Lieutenant Commander C. W. Sullivan of BAR, Dallas, to borrow material from the supply system until manufacturers' supplies began flowing into the Corsair factory.

About this time a fourth problem was added when it was decided to incorporate an improved cockpit heating and ventilation system in the winterization project, this involving a fairly new high-pressure system with little service experience behind it. Within days, Chance Vought plus Goodrich plus Eclipse Pioneer plus Hamilton Standard got an airplane together in the shop. But a heartbreaker occurred when everything was fired up and a de-icing boot sprung a leak. The boot installation had to come off, a time-consuming job for re-installation. Then difficult problems were encountered with the propeller de-icing system, such equipment having never been applied to the type of propeller blade used by the Corsair.

Ground and flight tests of the propeller de-icing system were conducted to check the flow pattern of alcohol across the blades, sprayed previously with a fine coat of Bon Ami mixed with water. Gaining the correct flow pattern, attention was devoted to the cockpit heating and ventilation system. It was known that the new system would keep the pilot warm, but there was insufficient heat for windshield defogging and defrosting. So an external scoop was added to obtain more ram air for the 50,000-BTU combustion heater on a theory that the more air there was, the more heat could be carried into the cockpit. The resultant heat just about drove the pilot out.

"Operation Sniffer"

Another problem was in preventing ice formation outside of the windshield, once inside defogging and defrosting were accomplished. Nozzles were mounted outside to spray alcohol in the manner done by the "little squirts" on autos which douse windshields with water. Almost immediately the pilot began reporting alcohol fumes in the cockpit. Thorough studies showed the airflow and aerodynamic shape of the windshield were sending alcohol sluicing from windshield edges into the air scoop, down through the ventilating system and up into the cockpit, producing a mildly toxic effect. Considering all the electrical switches and other spark makers in the cockpit, such a situation was explosive to say the least.

Then "Operation Sniffer" took shape. Alcohol was discontinued for the tests and essence of peppermint used in the de-icing fluid tanks. Pilots were to watch the fluid's flow pattern in addition to checking for odors. Sure enough, the peppermint odor showed up in the cockpit. As a cure, the heater scoop was blocked off but peppermint traces still were reported by the now supersensitive pilots. Canopy sealing was started but by that time the cockpit was so permeated with peppermint that pilots still smelled the stuff even after the de-icing equipment was removed. Finally the air intake was relocated to provide an internal air source, capable of sufficient ram and quantity. Judicious canopy and access panel sealing eliminated the peppermint smell before alcohol was again tried, this time satisfactorily.

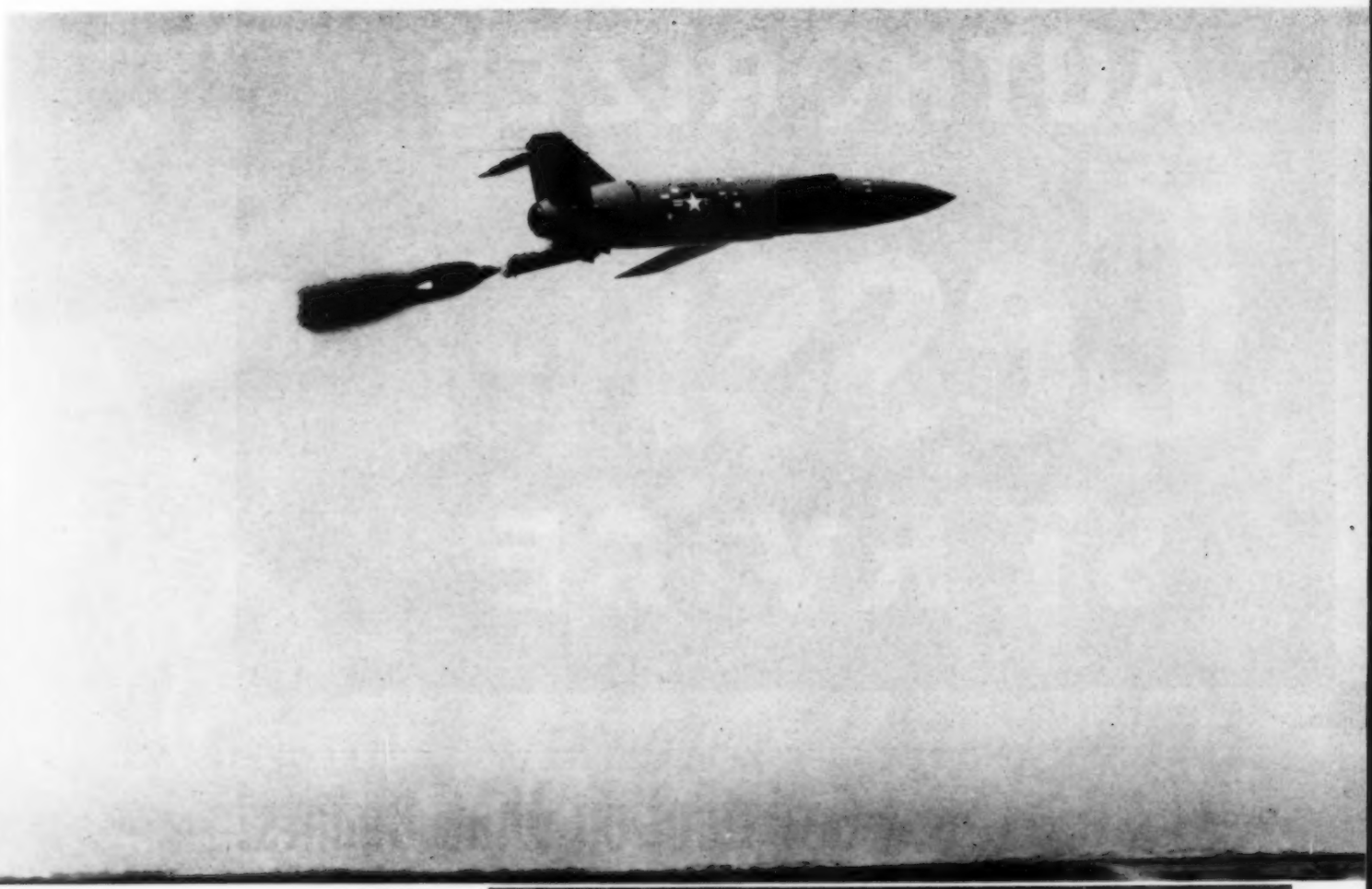
Now well along on the project, Tereshkow was transferred to something more challenging. Then the Corsair winterization encountered another snag—alcohol, basically a hydrocarbon, produced a crazing of spiderweb effect on the Corsair's plastic windshield and canopy. Another grade of Plexiglas was chosen and research produced a protective coating to withstand solvents such as alcohol. This coating was needed only around the edges of the glass where the fluid was being trapped.

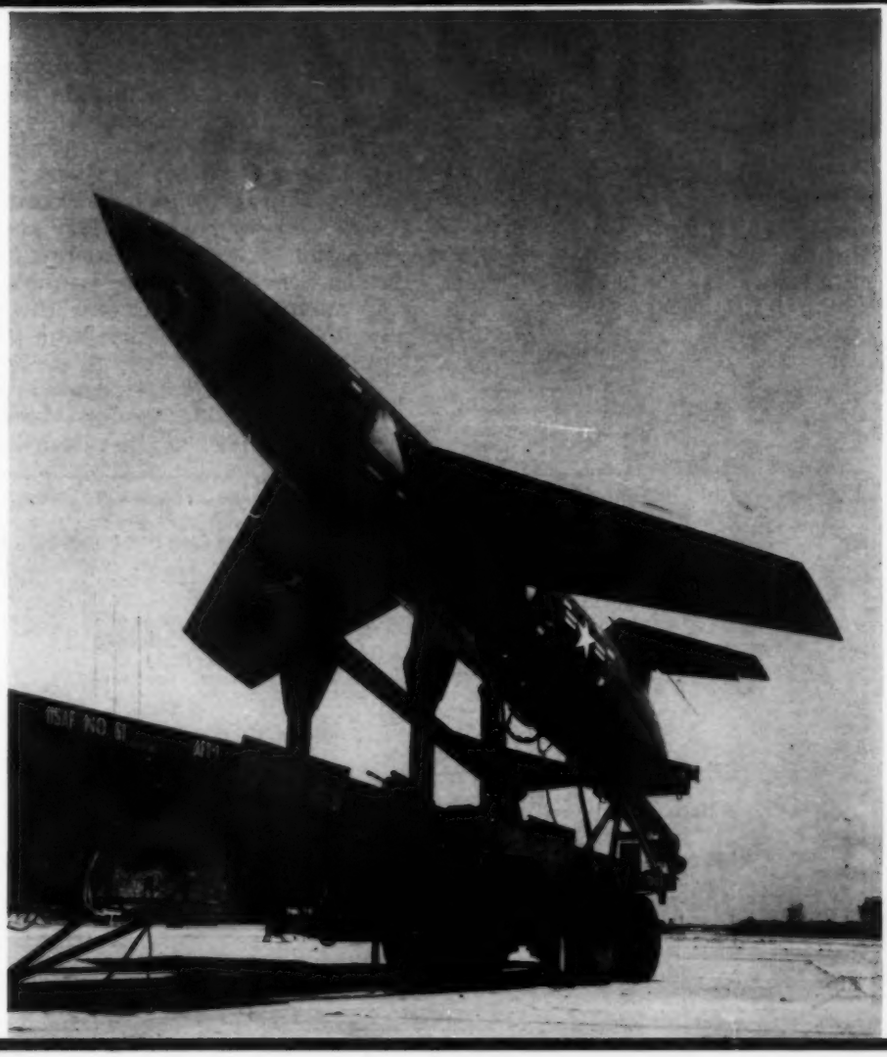
The final step in making the F4U-5NL Corsair a true all-weather night-

Overcoats for winterized Corsairs protect against weather on the ramp.

fighter was the custom-fitting of frost covers, to be pulled over wing and tail surfaces, canopy, engine cowling, propeller and wheels for protection from the elements while the planes were inactive on the ramp.

It was a victory over all kinds of problems that allowed Chance Vought to deliver the winterized fighters to the Navy ahead of schedule, a victory necessary to maintain air superiority where and when needed. It took a "fire drill" to do it. There will be more "fire drills" around Chance Vought and other aircraft factories during the months to come. ★ ★ ★





PILOTLESS B-61 MATADOR BOMBERS like these two are under advanced development at the USAF Missile Test Center, Cocoa, Florida. Flight view above shows Matador, produced by Glenn L. Martin Co., gathering speed soon after launching, with thrust still being provided by a rocket mounted under the tail. Rocket is automatically jettisoned after turbojet engine in fuselage generates sufficient power to take over with its thrust. Crew in "mother" plane which accompanies pilotless bomber guides it by remote control throughout flight and into distant target. Launching platform is shown at right. Note droppable rocket protruding down and back from beneath the tailpipe. Air intake for jet engine appears to be in belly beneath wing. Nose carries warhead. Matadors in field use are one-hop aircraft, being expended on each flight. Sharp sweep-back, thin airfoil and tail design indicate very high speeds, while use of jet engine in addition to rocket would be for considerable range.
—(Glenn L. Martin Photos.)

flight pictorial

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from leaders in the industry

CESSNA owners recognize the Cessna Sign of Service because Authorized Cessna Service Operators from coast to coast display it proudly. Behind this sign stands their integrity as leaders in their field—backed by the integrity of Cessna Aircraft Company as leader of its field.

From the Authorized Cessna Service Stations listed below you get factory-approved quality standards in repairs and maintenance, parts and accessories. Flat rates are yours, too—ask your Authorized Cessna Service Operator to show you his thorough and accurate flat-rate manual. He'll welcome the opportunity and will gladly tell you how his rates for maintaining your Cessna are established. What is more, he will stand behind every job analysis he offers—your assurance that skill and efficiency are at work for you.

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These progressive Cessna Authorized Service Shops offer flat-rate service.

Aircraft Sales Company
Meacham Field
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Champ's Flying Service
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Clinch Flying Service
Municipal Airport
North Platte, Nebraska

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Mustang Aviation, Inc.
Mustang Airport
Dallas, Texas

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Southwestern Skyways, Inc.
Ragle Airpark
Santa Fe, New Mexico

Kenneth Starnes Aviation Service
Adams Field; Little Rock, Arkansas

West Texas Flying Service
Midland Airpark
Midland, Texas

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

IT'S 9:00 A. M. AND WE NEED THOSE PLANS APPROVED IN NEW ORLEANS AND BACK HERE *TONIGHT*
DON'T WORRY, I WILL BE BACK IN KANSAS CITY IN PLENTY OF TIME

Cessna 170

America's Lowest priced 4-place, All-Metal Plane... by Several Thousand Dollars

GET ALL THIS IN YOUR NEW AIRPLANE AND ENJOY...

All-Metal Construction. Gives you rugged strength, greater safety, lower maintenance. Guarantees additional usable years.

High Cruising Speed and High Economy. Cruises faster with more miles per gallon than any plane in its class . . . proven by recent efficiency races.

Travels with 4 Adults in Comfort. 4 adjustable, foam rubber seats, ample leg room front and rear gives you solid comfort during long trips.

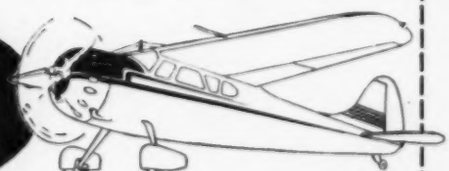
Low Noise Level. Fine new soundproof features let you converse in normal tones during flight. Try it.

Sufficient Pay Load. Take 4 people, luggage and gas for a 500-mile hop—safely, without exceeding legal pay load.

Prop-to-tail Reliability. Practical design, steel construction proven power plant and shock-proof landing gear, quality built throughout.

When you examine the new Cessna 170 you'll see *why it outsold all other 4-place airplanes during 1950*, regardless of price . . . you'll see why this quality, versatile, economical plane was built with *you* in mind.

Cessna 190 SERIES



Designed especially for business use, this big, beautiful plane seats 5 with comfort, cruises at over 160 m. p. h., is easy to fly, economical to use. Airline-type engines and Hamilton Standard Constant Speed Propellers.

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fenced Majors Field and added two former hospital buildings to house personnel and a cafeteria. The com-

AIR REPORT

(Continued from page 7)

PIPER AIRCRAFT has sent two of their men to Europe. They are Sales Manager J. W. Miller and Export Representative Frank S. Jonas, who will demonstrate Super Cubs, both as liaison and sprayer craft, before representatives of European, African and Middle East nations.

OZARK AIRLINES is to receive a new hangar now under construction at Lambert-St. Louis Municipal Airport. The hangar, 200 by 165 feet, will accommodate 6 DC-3's and is being built by the city.

A JET PLANE STARTER has been developed by Bendix Aviation Corporation and was demonstrated to a group of British Aviation experts recently. The starter weighs 75 lbs. and develops 380 hp.

OVERHAUL AND MODIFICATION OF J-47 JET ENGINES will be provided by General Electric at their new shops at Strother Field, Arkansas City, Kansas, with a capacity of twelve engines at a time.

HAMILTON STANDARD has produced a new line of starters for turbine power plants. Starting time is reduced to 20 seconds by the starter on jet bombers, it turning up to 45,000 rpm. to develop 100 hp.

SUCCESSFUL AIRCRAFT NUCLEAR PROPULSION was predicted by Dr. M. C. Leverett of General Electric before the Chicago Section of the IAS recently. Consolidated Vultee is to supply the airframe and GE is responsible for the propulsion system in the government's aircraft nuclear propulsion experiments.

LOCKHEED F-94 INTERCEPTORS AND T-33 TRAINERS are being produced with up to 3 days saved by a new method of testing jet engines. Within minutes, engines placed in an old jet fuselage on tracks and equipped with a silencer and attachable fuel lines, are tested without the necessity for flight. . . . **COST OF F-94 JETS** has been determined to be only in excess of 5 per cent of the old P-38, after adjustment for higher production, lowering of unit costs, and depreciation of the dollar, according to Lockheed. Radar and electronic equipment in one new jet is equal in cost to the old P-38 airframe.

INDUSTRIAL ACREAGE ON EL PASO INTERNATIONAL AIRPORT has been offered in an attractive folder distributed by the El Paso Chamber of Commerce in its drive for new industries. Available industrial sites covering some 1,941 acres are described in detail in the folder, which states that the land "is owned by the City of El Paso and may be purchased or leased as a whole or in part—you will find a cooperative attitude on the part of municipal authorities; the city is willing to consider any reasonable proposal for the financing of plant construction and the rental of same on a fair amortization basis." Charles B. Moore, airport manager, will gladly send interested parties a copy of the folder.

TAMPICO HURRICANE didn't blow Francis McDonald's hunting and fishing camp for airmen off the Mexican island 40 miles South of the tarpon city, but it had the same effect. Mack is moving to a river location on the mainland 60 miles above Tampico. "We were slapped around a bit by the storm but could have taken a lot more damage," Mack writes. "We barged 30 tons of stuff including houses and all to Tampico and are now moving it over jungle trails to the new spot, re-opening on Nov. 1. Fellows back in the States have been most sympathetic after hearing about the hurricane. I received letters from all over. Makes a guy feel good inside to know he has friends pulling for him. Got a call from Currey Sanders—good ole Currey." McDonald, after years of executive piloting, "retired" to the Mexican island several years ago and with scores of Indians hacked out a couple of good air strips. Hundreds of pilots and their guests have enjoyed excellent fishing and hunting with him there. He says the new spot is even better. He can be reached by air mail letters at 522 Edificio Luz; Tampico (Tamps.), Mexico.

FIRST BOEING B-47 STRATOJET ASSIGNED TO THE U. S. AIR FORCE STRATEGIC AIR COMMAND has been delivered to MacDill Air Force Base, Florida. It averaged 575 miles per hour on the 1,090-mile flight, 6th Air Division HQ announced, landing only 1 hr. 50 min. after taking off from Wichita, Kansas.

TEMCO HAS CONTRACTED FOR FURTHER EXPANSION of its shop-hangar facilities at Majors Field, Greenville, Texas. Original contract to build a 165 x 167 foot main building has been suplemented to add a 50 by 167-ft. metal addition. Temco has

GM To Produce Grummans at New Dallas-Fort Worth Factory

General Motors will build an auto-aircraft plant at Arlington, Texas, between Dallas and Fort Worth, with completion date fixed as early in 1953. Employing 6,000, the plant will be dual-purpose, serving as a factory for aircraft or other military production or for the assembly of Buick, Oldsmobile and Pontiac cars, or for both cars and war goods.

The company has received a prime contract from the Navy to produce an undisclosed Grumman-designed airplane in large quantities. Tooling for the manufacture of the planes will begin immediately, prior to plant construction.

General Motors produced 13,500 Grumman fighters and bombers during World War II.

PARTICIPANTS IN LEAR L-2 AUTOPILOT SCHOOL AT GRAND RAPIDS FACTORY numbered 85 from 64 Lear distributors located in 55 cities serving civil aircraft owners and pilots. W. P. (Bill) Lear, who perfected the L-2, and his engineers and servicemen conducted the school and Lear personally flew the participants in Lear aircraft to demonstrate L-2 operations and calibration in flight. Better service for L-2 users in local communities was the goal of the factory course. —(Lear Photo.)

GETTING THE JOB DONE

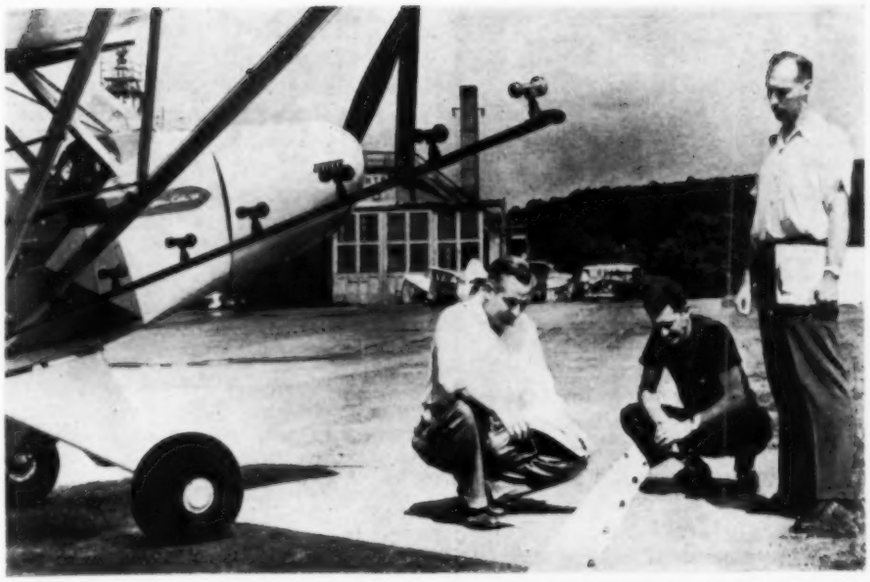
fenced Majors Field and added two former hospital buildings to house personnel and a cafeteria. The company's Greenville division, employing 750, is overhauling C-54's for the Air Force.

TWO NEW AERO COMMANDER DISTRIBUTORS are AiResearch Aviation Service Co., Los Angeles, and Art Whitaker, Vancouver, Washington. Eddie Bellande, vice president and manager of the AiResearch organization, has 24,000 hrs. of flying behind him. As test pilot for Lockheed he flew the first of the famous Vegas, checking out Wiley Post in the "Winnie Mae." His company is one of the nation's leading service operators for multi-engine corporate-owned executive transports. Art Whitaker is one of the country's best known fixed-base operators, having been in aviation business for over 25 years. Besides offering complete sales and service facilities, Art also manufactures aircraft dusters and sprayers, tandem landing gear and combination dusters and sprayers.

MERGER OF CONTINENTAL AIR LINES AND MID-CONTINENT AIRLINES is proposed by a CAB order issued last month, calling on the two carriers to show cause why the public interest does not require integration of their routes into a single unified system, either by consolidation, merger, acquisition of control or other appropriate means. CAB said it is concerned over the weak route structure serving the Midwest and indicated the proposed action would make possible a million-dollar reduction in subsidy requirements of the two airlines.

TWO NEW VERSIONS OF THE F-86 SABRE have been ordered into production by the Air Force. North American Aviation will produce the new model F-86F at Columbus, Ohio, early next year, followed by production of "H" models at Los Angeles.

STEADILY INCREASING DOLLAR RESERVES IN LATIN AMERICAN COUNTRIES interested in buying U. S. aircraft and aviation products are reported by Gilbert D. Clark, Convair regional sales manager, on his return from a survey. Dollar shortages in the past prevented sales of modern airline fleets until now, and orders for Convairs are expected to result from the improving situation due to U. S. purchases of Latin American iron ore, tin, oil, manganese and bauxite. Clark said the supply of old war-surplus transports has practically vanished from the area.



AGRICULTURAL DEVELOPMENT DIVISION of Piper Aircraft Corp., has launched experiments to improve dispersal equipment for agricultural chemicals. Shown here examining the uniformity of spray application on a strip of paper are the three Piper officials who head the new division. Left to right are Rex Taylor, chief of experimental; Alfred B. Munroe, veteran agricultural pilot, and Howard Piper, assistant to the president and himself owner of a crop spraying fleet. Piper is producing agricultural versions of the 125-hp. Super Cub at a rate of one per day.
—(Piper Aircraft Photo.)

PRODUCTION OF 125-HP. AIR-COOLED DIESEL ENGINES FOR LIGHTPLANES is planned by Diesel Power, Inc., of Pittsburgh and Los Angeles, following flight tests in Pittsburgh last month in which the engine powered a Taylorcraft liaison plane. Rated at 125 hp. for take-off at 2,600 rpm., and 100 hp. at 2,400 rpm., the engine is said to have consumed only 4 gals. of 43-gravity kerosene per hour at a cruising speed of 2,350 rpm. and at 1,000-ft. altitude. Exhaust was clear of smoke. The Diesel eliminates carburetor and ignition problems. Of 4-cylinder opposed design, the engine weighs 245 lbs. dry and has 290-in. displacement. Compression ratio is 14 to 1, bore is 4⅞ ins. and stroke is 3⅞ ins. A combustion starter is used.

★ ★ ★

IT TAKES 'EM ALL to bring scheduled air service to the local community—that's the point illustrated by these pretty stewardesses. Southern Airways carried them on its inaugural flight to the Mississippi Valley portion of its system. Each connecting airline sent one of its stewardesses along to help Southern do the selling job for all.
—(Southern Airways Photo.)

Questions and Answers

For Quicker Starts this WINTER...

Let Aircraft Sales Company, Meacham Field, Fort Worth, prepare your aircraft for the LONG COLD WINTER MONTHS ahead. A complete check of the electrical and ignition system will pay extra dividends with "sure-fire" starts.

Champion Aircraft Spark Plugs have proven their dependability through unfailing operation under all conditions. Aircraft Sales Company maintains a complete stock of all sizes and types of Champion Spark Plugs to serve every aircraft.

For that POWER PUNCH in cold weather, Aircraft Sales Company offers the new REBAT, the finest in aircraft batteries, manufactured by Reading Batteries, Inc. Every Rebat Aircraft Battery is specifically designed to give outstanding performance and long-life dependability.

Whatever your aircraft needs, Aircraft Sales can serve your requirements.

AIRCRAFT SALES COMPANY

Meacham Field
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GETTING THE JOB DONE

(continued from page 17)

Locke, director, Iowa Aeronautics Commission, "The Airport's Responsibility in Civil Air Mobilization"; H. L. Nichols, chairman of the board, Southwestern Public Service Company, "The Airplane as an Executive Tool"; Roland Lewis, director of Airports and facilities, Braniff Airways, "Let's Not Stifle Aviation On the Ground"; Culver Keenan, manager, Davenport (Iowa) Municipal Airport, "The Small Town Story"; George McSherry, superintendent, New York International Airport, New York City, "The New York Story"; George E. Haddaway, editor, FLIGHT MAGAZINE, "What's Cooking In Flight Training"; Al Harting, director of public relations, Southwest Airmotive, Dallas, "Home Town Public Relations"; Frank Trumbauer, assistant to regional administrator, CAA, Kansas City, "Service Is Good Public Relations"; Elmer Conner, Zigler Flying Service, Jennings, Louisiana; Roy Mahon, Boot Hill Flying Service, Dodge City, Kansas, and Dr. Ken Messenger, U. S. Department of Agriculture, Oklahoma City Research Center, each covered timely aspects of agricultural aviation during a panel session entitled, "You Can't Fight a War On An Empty Belly." Session chairmen included W. T. (Bill) Brown, chief management consultant, Fourth Region, CAA, Ft. Worth; George Vest, regional administrator, Third Region, CAA, Chicago; Charles Hanst, chief management consultant, CAA Second Region, Atlanta, Georgia; Paul Morris, chief, operations division, CAA, Washington; and S. E. Travis, Jr., chief, airports division, Fourth Region CAA, Ft. Worth.

The Conference wound up with an off-the-record "Cuss and Discuss" period chairmaned by the new director of aeronautics for the state of Texas, Cliff Green. By unanimous vote, the 1952 Conference will return to Oklahoma University October 9-10.

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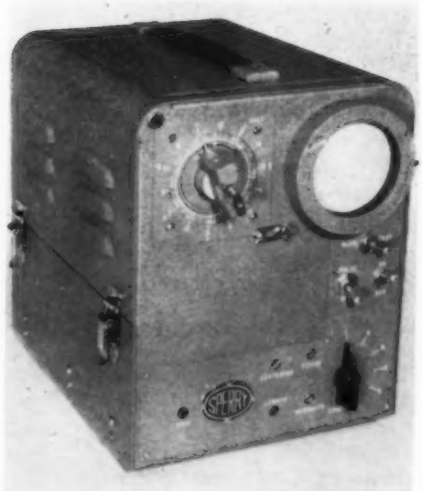


PORTABLE ENGINE ANALYZER being introduced to market by Sperry Gyroscope Co., electronically detects, locates and identifies detailed ignition and mechanical troubles in power plants containing any number of cylinders. Cathode ray tube in right corner of instrument provides graphic patterns which reveal operating condition of engine. "Cycle selector" control in left corner has calibrated dials which show cylinder numbers and degrees of crankshaft rotation. The new Sperry portable is useful at high altitude in flight as well as on the ground around the shop. It weighs less than 27 lbs.
—(Sperry Photo.)

Dual Fuel System for Single-Engine Planes

THE Engineering Experiment Station at Texas A. & M. College in experimental work has achieved twin-engine fuel system safety with a single-engine aircraft. An earlier piece of work was done on twin lubricating systems. Of 1,353 accidents in private flying during 1947 due to power failure, seven-eighths of those of known cause came from fuel system failure. Complete fuel system reliability has since become the aim of the experiments by Texas A. & M. College. Studies have been made with the 4-cylinder Continental C-85 engine with an Excello fuel injection system.

The problem was chiefly mechanical for accurate control of metering valves and fuel-air mixtures. A linkage for the duplicate system was fabricated and tested in an Ercoupe airplane. Two throttles were provided. Extensive flight tests with the duplicate system were made. Failure of either of the fuel systems in flight was simulated by the operation of a valve by the observer without warning to the pilot. This was done under numerous conditions in cruising and climbing flight. Performance was pronounced entirely satisfactory, using either one of the duplicate systems or both together. No excessive fuel consumption was noted.

The researchers believe that the linkage system can be greatly simplified by using a single throttle operating a single air butterfly valve and both fuel metering valves. By means of a single selector valve handle, the fuel would be directly toward the injection nozzles from one injector pump, the other injector pump, or a part from each. Two valves could be controlled by a single handle, and both valves could be machined on a single shaft. Work is now under way on this problem, and also on the feasibility of using two carburetors in a twin fuel system.

Detailed results of these experiments may be obtained in Research Report No. 27, "Investigation of Twin Fuel Systems on an Aircraft Engine" by James G. McClure, Texas Engineering Experiment Station, College Station, Texas.

(if that's the way you handle it) to

weeks at 25 cents a square foot. He

Questions and Answers for Airport Operators

When Competition Comes

QUESTION: I am the owner of a fixed-base operation on my own field. There is no public airport in this town of about 4,000 people. I leased the ground on which I set up my airport in 1938 and have operated there since that time.

In 1944 I was able to buy the ground and then build a better hangar and shop building. I went through GI training and didn't do badly. My operation provides all the normal services plus a small spraying business. One aircraft is rigged for spraying and I operate that myself when I have a job.

Recently a large firm of dusters and sprayers was asked to move from a field which we understand is to be reactivated as a military airport. This field is in a town of about 30,000 some 35 miles from here. This outfit is willing to build its own hangar on a long-term lease on my field if I will give them first option to sell the whole airport to them in case I ever decide to sell. They want to bring in their own gas, pay $150 a month for the hangar site and use of the field.

I am holding out for two things, 15 per cent of their gross and that they buy all their gas from me. I feel that they are competitive with me and should pay for what I'll probably lose in my spraying business. They say "no" to both of those. I feel that this is my field and I can do what I please about the terms of any lease. What are your feelings?

ANSWER: Your field is your own. Basically you can do as you please. However, so can the other party in this negotiation. Let's not kick a lot of ravelled theories or opinions around. Instead let's look at your problem with a cold eye on the economics.

Take the matter of competition first. These people are only 35 miles away from you now and they have a big business. Actually we believe they are competitive with you right now. They probably handle a lot more acres than you do right now in your own county. You apparently have not gone after this business heavily or you'd be using more than one sprayer.

So if they came to your field they would still be competitive, but would they be any more competitive than they are now? On the other hand if your negotiations reach a stalemate, could they not lease or buy a suitable strip in the vicinity of your town and be just as competitive as they would be on your own field? And you would not get a dime out of their operation. Frankly you are not in a position to keep them from doing that.

Now as to the money end of the deal. Where did you get the 15 per cent, out of a hat? Do you believe they are making a net profit considerably in excess of 15 per cent of the gross? Perhaps they do, but we think it unlikely after all costs, both fixed and operating, are considered. Do you make that much out of your sprayer after figuring all expenses including a reasonable salary for yourself as pilot and all your operating and fixed costs which include a portion of the maintenance of the landing field and amortization of your investment?

We don't mean it's impossible for an applicator to make that much. It is our understanding that it is possible with efficient operations and a tight set of books. The question is, can they count on doing this over a long lease period of years in the face of good years and bad ones, rising or falling prices of the applicator's materials and equipment and the farm prices of the crops treated?

We believe that if you want to charge on a percentage basis, it should be a realistic one and it is not likely to be 15 per cent. The $150 a month offer may not be enough, but before you decide on an amount get your bookkeeper or your outside accountant

Airmen's Calendar

Nov. 6-10—Symposium of Upper Atmosphere Physics and Medicine Sponsored by Air Force School of Aviation Medicine and Lovelace Foundation, Plaza Hotel, San Antonio, Texas.

Nov. 7—Annual Wings Club Dinner, Waldorf-Astoria Hotel, New York City.

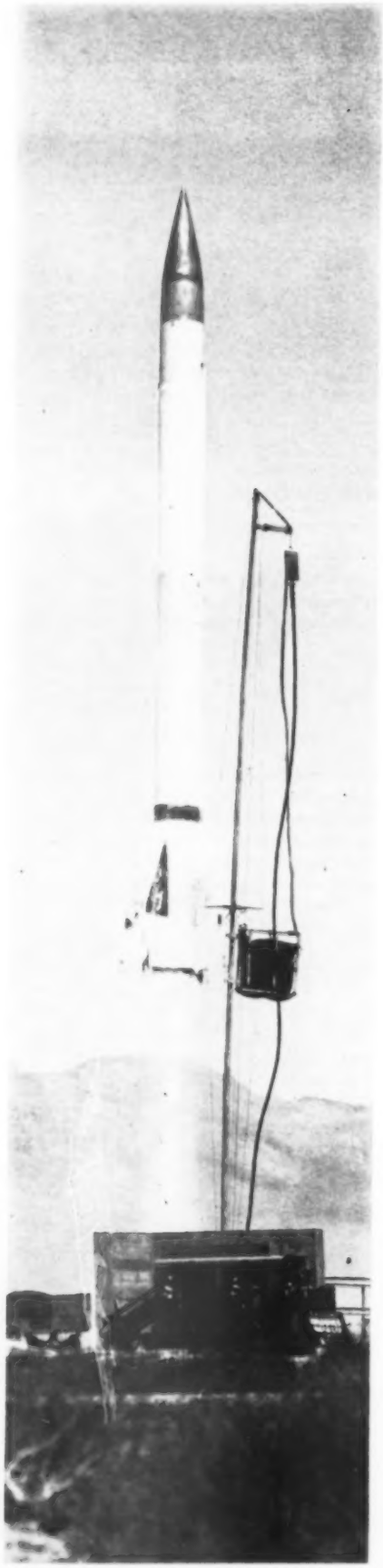
Nov. 13-16—National Aviation Trade Association Annual Convention, Fort Worth, Texas.

Nov. 28-30—Annual Winter Meeting, Aviation Distributors and Manufacturers Association, Waldorf-Astoria Hotel, New York.

Dec. 4-5—Transport Aircraft Hydraulic Accessory and System Clinic, Vickers, Inc., Detroit, Mich.

Dec. 17—15th Wright Brothers Lecture, U. S. Chamber of Commerce Auditorium, Washington, D. C., and Wright Memorial Dinner, Statler Hotel, Washington, D. C.

HOW AVIATION HELPS community progress is dramatized by this billboard photographed in Decatur, Illinois. A local advertising firm used its billboard space to proclaim a community welcome to Ozark Airlines when the new local service air carrier began operations there. Air service, as the sign emphasizes, means progress and growth to the small cities of America.
—(Ozark Airlines Photo.)



UP FOR RESEARCH goes the U. S. Navy's Martin Viking rocket to a new world's record altitude of 135 miles for single-stage rockets. The German V-2 altitude record was 114 miles. It consumed all its fuel within 75 secs. attaining 4,100 mph. (Glenn L. Martin Photo.)

(if that's the way you handle it) to give you a sound cost figure on the operation, ownership and maintenance of your landing field. Also a separate figure on a reasonable rental value of the land for the hangar.

Then you can figure out whether the rental figure would leave you with a profit or loss on your airport field operations on a basis of increased use. As for the gas, this is a major item of cost and since much of their business will be away from the immediate vicinity of your field, gas will be taken on at operating strips and bears little relation to the use of your field. They may even buy gas in such quantities they get it for less than you pay for yours.

All in all we believe that so long as they are going to operate in your area it would be good business for you to work out a reasonable arrangement with them at an acceptable profit to yourself. Do it on a basis of sound figures and realistic economics. An exorbitant rental won't keep them from being competitive with you. It will just cause them to seek another base of operations.

We're for Brevity

QUESTION: It's still rather warm down here and all of a sudden the girls who work on the airport blossomed out in shorts. The first one was an instructor, then a couple of students and now two or three of the girls who work in the hangar offices have done it.

I don't think it's a good thing, considering all the men working and flying around here. Is there any way I can stop this practice?

ANSWER: We hope not.

Airport Managers Need Authority

QUESTION: About three weeks ago I had an experience with an airport and I'd like to tell you about it. My firm is building a new store in this particular town. It had to be that way because the town is going ahead so fast we couldn't rent space for either store or storage use. Everything was figured on schedule. The completion date was set. The day after that merchandise was scheduled to start coming in. This meant a lot of merchandise, by trucks and railroad, from scores of manufacturers and shippers.

Shortly prior to the completion date, the contractor told us he couldn't make the date by two weeks in spite of the penalty clause. We couldn't stop shipment of about 90% of the goods. We suddenly had to have about 8,000 square feet of storage space for cased and packaged goods that would be subject to heavy loss if we couldn't put it under cover. There wasn't any storage space available. We were sunk. This was the day before the first shipment was due.

Then the airport came into the picture. I found they had an empty hangar. I went to see the airport manager and offered to rent the space for two weeks at 25 cents a square foot. He asked if it was an aeronautical business and I had to say no. He couldn't give me an answer, but he called the mayor who couldn't or wouldn't give him an answer.

Well, in turn I went to see the mayor, the city attorney and seven of the eight council members, and I got nowhere for four days and there was that perishable merchandise laying out in the open on docks and on the ground. It looked like rain every day.

Then out of a clear sky the airport manager called me and told me I could use the hangar. All that stuff had to be reloaded on trucks and moved into the hangar.

I know this isn't really an aviation question or is it, but why can't a man get an answer in a deal like this?

ANSWER: Your experience is a very plain example of one of the greatest faults in the management organization of airports. That fault is a lack of authority in the airport manager to exercise enough judgment to be able to say "yes" or "no" in a reasonable length of time.

It is the result of cautious tendencies of most political subdivisions when confronted with the need for a quick decision. Everybody concerned is apparently afraid to give any one person authority. When you are in a hurry it pinches. It would have been understandable to you if you had been asking a five year lease, wouldn't it?

But here you asked for two weeks at a rate that probably was equal to a year's rent normally and no one would get off the fence long enough to give an expeditious answer. It's a wonder you didn't have to wait for a regular meeting of the city council.

In an ideal airport management and city organization structure the airport manager would have had enough authority to say yes and then pass his action on to his superiors for endorsement. There are many airport conditions which require that quick authority to act. But the city officials must have pretty full confidence in the airport manager to do that and in order to have the confidence, they probably are going to have to pay them more money than many of them get now. Then the manager himself has to be willing to accept the responsibility of saying yes or no without getting every one in the local government to okay his action in an emergency matter. If he doesn't have any authority, a big part of that lack is sometimes the manager's own fault.

Of course, there are some airport managers who would have had guts enough to give you the go-ahead in the face of your desperate situation, but you didn't find one. After all, strong managers are usually that way because they have earned the right to such confidence.

Yes, you're right. It wasn't exactly an aviation question but it emphasized one of the failings of management that sadly needs correction. ★ ★ ★

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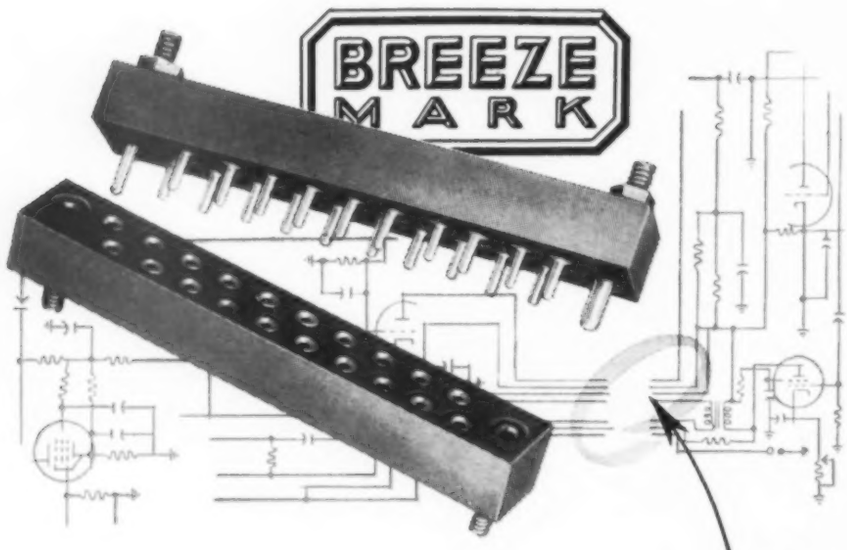
need to know what I already know because my previous minimums have



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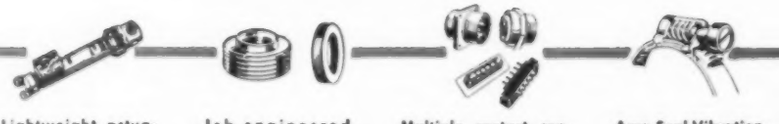

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CALL ME CONSERVATIVE

(Continued from page 13)

timeter correct? How about ice? How about your being on your own under similar conditions? How about—." I interrupted at that point and said, "How about us getting the hell out of here?"

At about that time we broke out, with a good ceiling, and it was then that I learned that my instructor had made arrangements with the CAA for this flight.

We proceeded back to the airport and he said, "Now go get yourself some instrument training and come back and talk to me later if you want to discuss this subject further."

So with about 200-plus logged solo hours I took 35 hours of Link and 10 hours under the hood during my second year of flying. I did pretty well and for a while I thought I would get out of the "average" pilot stage and go into the "professional" stage, flying instruments all the time, single-engine notwithstanding. Then I did it.

We Prayed in Minneapolis

Flying up to Minneapolis one cold Christmas, I left Des Moines with a 2,500-ft. ceiling, visibility just fair. Out of DesMoines I bird-dogged on the Mason City range and was flying along serenely when something appeared ahead like I never saw before. I got on the radio and talked with Des Moines and they repeated I had 2,500 feet, so I held the altitude and went into the stuff. It turned out to be snow. Since it didn't stick to the wings and there was no ice, I continued on, passed right over Mason City and on to Minneapolis, holding doggedly to the 2,500 feet on instruments.

Now it is humanly impossible to exercise two emotions simultaneously. Instead of getting scared I got mad and started cussing everything — yankees, the government, the weather and everything else. Just hunched down in the seat and practiced those instruments all the way for nearly an hour and a half. When I let down at Minneapolis the ceiling was a nice 2,000, just 500 feet below me! And it had been there all the way from Des Moines! That was the end of my instrument course and my desire to fly them. When I cut the switch at Minneapolis I prayed long and diligently for forgiveness, promising never to do it again. I've kept that promise.

Sure, I can climb up through an overcast, and make a let-down; I can make good timed turns and fly an assigned altitude. I have three radios and a full panel of instruments. But still I don't do it. And I doubt very much if I ever get in a crack where I will

need to know what I already know because my previous minimums have been tightened up. Even when I swap in my Bonanza next year for my new twin-Bonanza with Lear autopilot, I'll lay off the instruments. I'm not a professional pilot with instrument rating.

Sometimes I think that discovering all the things about flying is like a baby discovering its toes—one at a time. This instrument deal was the big toe on one foot. After four years of flying I found the big toe on the other foot. It's this—don't jump in just any airplane with just any pilot.

Has This Happened To You?

Not long ago I accepted a ride with a casual acquaintance in a twin-engine ship. As soon as he started to taxi I wanted out. It was a busy airport and he started moving, without any line check, at 40 per hour without instructions from the tower. Fumbling with the radio, with which he wasn't too familiar, he got clearance and took off after a superficial run-up. He was smoking a cigar and as soon as we broke ground he opened the storm window and flipped his ashes through it.

At about 200 feet he leaned over and asked if he could show me how quickly he could feather one engine. I talked him out of it but at 2,000 feet he wanted to do it again. I convinced him that some day at 6,000 feet and with parachutes I might go for such a demonstration, but please, not now. After about thirty minutes up front I went aft and another pilot took my seat. A few minutes later the airplane lurched and the right engine was dead. It was a nightmarish experience—no flight plan, no constant altitude or heading, improper use of the flaps, no standard approach pattern. Fortunately, when he went in a short time later, he was alone. It was dark, and I understand there was some rain. The pity of it is this—such happenings are so unnecessary. We can and must learn some day. All of us.

I was prompted to start flying by indications of hypertension and my knowledge of a number of other surgeons suffering from heart attacks after years of strenuous service. I got to a point where I could hardly tolerate my best friends. Through flying, first in my Stinson, and later in my Bonanza, a new world opened up to me. My friends became delightful people again. I wondered why (and still wonder why) no one ever told me about this before. I retired from surgery and now have a radius of action in oil and real estate interests of about 2,000 miles. I have more to do and more leisure time to boot than ever

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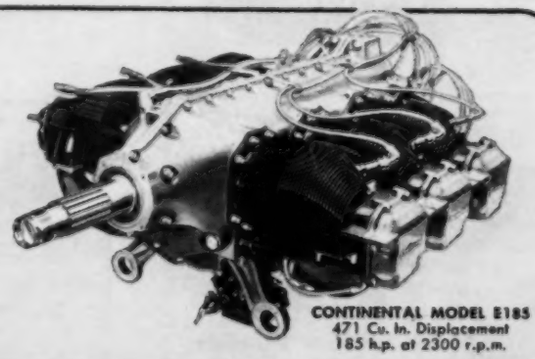

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before in my life. I am now a businessman pilot strictly and know that if I continue to bear down on maintenance (if you can't afford the best you can't afford an airplane), continue to go up to 5,000 feet at least once a month and practice turns and stalls to keep proficient, come in out of the rain and go to bed when it gets dark, maybe some day I'll be able to part my long, white beard to find the wheel and the throttle on my airplane.

There are many brains in aviation who know far more about our problems than what I'm trying to preach. But they aren't doing much about it. Maybe we've got to raise the standards of instruction, or show every pilot he can't fly instruments without professional instrument training and constant practice, and a lot of other things. But I do know this—I've influenced ten people to start flying and buy airplanes. But it's getting harder all the time because when you foolishly kill or injure a businessman pilot in a community through lack of proper instruction, the finest airplanes in the world will go begging. ★ ★ ★

JUST AMONG OURSELVES

(Continued from page 9)

thanks of the lightplane industry for contributions to more satisfactory airplane utilization.

Just recently Lear established at its Grand Rapids plant a school for technicians from its distributors, where factory instruction is given in the theory, installation and service of the L-2 autopilot. When Lear invited its distributors to send a technical representative to the school, promising to provide gratis all the housing, meals and instruction, the response exceeded all expectations. The program had to be divided into two sessions, the entire course being given twice to accommodate the large number of Lear distributor service managers who wished to attend. At that, it was necessary to conduct the classes in the Grand Rapids Civic Auditorium to make room for the large attendance at each session. The final tally revealed attendance by 85 service managers representing 64 Lear distributors in 55 cities.

Factory service such as this is unprecedented in civil aircraft electronics. Bob-tailed shops just don't send their service managers to far-off factory training courses. That so many first-class, successful distributors participated is proof that this business has come a long way in recent years. Better service to owners and users of Lear equipment is the pay-off.

Lear's theory underlying the course of instruction was to provide airplane owners everywhere with factory-level type of installation and maintenance service for the autopilot in their own localities. Bill Lear himself gave most of the instruction and personally flew almost every one of the students in company-owned, L-2 equipped aircraft to demonstrate the operation and calibration of the autopilot in flight. Lear engineers associated with him in perfecting the autopilot assisted in the instruction courses, which included installation in various types of planes, the use of special test equipment in checking installations and the autopilot's performance, and the techniques of servicing and maintaining autopilots.

Hats off to the Lear organization and its distributors! They are providing the kind of service essential for expansion of private and executive flying. Airplane owners will obtain more and more usefulness out of their equipment. This practically guarantees progress in aviation, for it means ever-growing numbers of satisfied aviation customers. ★ ★ ★

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EXPANDING HELICOPTER OPERATIONS

(Continued from page 15)

and administered first aid to the victim, returning him at once to a Canal Zone hospital for anti-venom injections. The victim is recovering, thanks to the helicopter's versatility.

★ ★ ★

On its fourth anniversary, helicopter-operating Los Angeles Airways has completed 119,946 flights, carried 14,194,250 pounds of mail, flown 19,991 hours and 1,235,497 miles. ★ ★ ★

Navy Orders $36,000,000 Worth of AiResearch 100-hp. Jet Engines for Aircraft Starters

AiResearch of Los Angeles has received a $36,000,000 order from the Navy Bureau of Aeronautics for small gas turbine engines, air turbine starters and control valves, all representing starting equipment for seven types of Navy turbojet and turboprop aircraft. Coming after eight years of research and development, the order means thousands of units annually to be produced by AiResearch for several years.

The combination of the small gas turbine and air turbine starter will supply self-starting power for turbojet and turboprop engines that need up to 20 times the starting power of the largest aircraft piston engine. It gives continuous starting with the push of a button, a system not yet perfected for the most advanced foreign turbine propelled aircraft.

In the 100-hp. class, the turbine has been in manufacture for more than a year and has had thousands of hours of aircraft operation.

DEFENSE ZONES

(Continued from page 16)

ever, he shall make a report of such failure to an appropriate aeronautical facility.

Emergency Situations

Where the safety of a flight is involved, the pilot may deviate from ADIZ requirements as necessary to meet the emergency. When this occurs, however, he shall report the deviation and the reasons for it as soon as practicable.

Under emergency defense conditions which may involve the national security, pilots shall follow any additional special security instructions issued by the CAA for the identification, location and control of individual flights.

Prohibited Areas

There are prohibited areas within the Albuquerque, Seattle and the Knoxville ADIZ's. All aircraft are excluded from these areas for reasons of national defense.

Foreign Aircraft

Foreign aircraft entering the United States through a coastal or international ADIZ shall make the same position reports required of United States aircraft. As an alternative, pilots of foreign aircraft may report when the aircraft is between one and two hours average cruising distance, by the most direct route, from the United States, and thereafter report as instructed by the facility receiving the original report. Aircraft operating under the latter procedure must, of course, make any additional reports required for control of air traffic.

Violations

In addition to the penalties provided for violation of the Civil Air Regulations, knowing or wilful violation of the ADIZ requirements may result in a fine of up to $10,000, or imprisonment up to one year, or both.

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Meets your basic navigation and communication needs. Provides for VHF transmission, LF range reception and rotatable loop navigation.

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Adds two-way VHF communication. System includes tunable VHF receiver and a five-channel, crystal controlled VHF transmitter. As many as four of these transmitters may be installed providing up to 20 channels.

THE ARC TYPE 12

Gives you the combined advantages of the type 11A and the Type 17 systems. You get two-way VHF communication and LF range reception, as well as rotatable loop navigation.

Ask about ARC Type 15C Omnirange equipment and ARC's 10-channel Type F11 Isolation Amplifier. Write for all the details.

All units of these systems are type certificated by the CAA. Installations for both single and multi-engine planes are made only by authorized agencies.

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LIGHTPLANES ON AIRLINES

(Continued from page 15)

age of only 136 mph. on the same basis for its DC-3's after they went into operation.

Central's Bonanza records show the 4-place, 185-hp. planes averaged 9.62 gals. per hour for fuel consumption during the 21 months, consuming some 165,000 gals. of fuel. Bonanza load factors ranged from 10.06 per cent for the first month of operation to 49.24 per cent for the month of May, 1951. The average Bonanza load factor for the 21 months figured out to be 22.6 per cent.

During the 21-month period, 2,342,322 miles were scheduled to be flown by Bonanzas. Limited to daylight contact operations, they actually completed 2,199,138 miles in scheduled operations. This amounts to a 21-month completion factor of 94 per cent. During the period from November, 1950, through May, 1951, when Central operated both Bonanzas and DC-3's on separate routes in the same general territory, the little Bonanzas completed 96.5 per cent of schedules while the DC-3 completed 98.2 per cent of its schedules. The A-35's completed 100 per cent of schedules during their last month. ★ ★ ★

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CIVIL AIR REGULATIONS HANDBOOK FOR PILOTS. Summer, 1951, Vest-Pocket Edition, 50c. Ross Publications, Box 2092, Arlington 4, Va.

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DEALER	TOWN
City of Abilene	Abilene
Abilene Aviation Co.	Abilene
Lynn & Haner	Alice
Chambers County Airport	Anahuac
Jefferson County	Beaumont-Port Arthur
Travland Airport	Beeville
Reed's Air Service No. 2	Belton
Fort Clark Ranch	Brackettville
Breckenridge Flying Service	Breckenridge
Frontier Airmotive, Inc.	Brownsville
City of Brownwood	Brownwood
Cardwell Flight Academy	Bryan
Rogers Air Service	Cameron
City of Coleman	Coleman
A. & M. College of Texas	College Station
Conroe Aircraft Sales & Service	Conroe
City of Corpus Christi	Corpus Christi
Glasson Flying Service	Corpus Christi
F. H. Jackson	Cypress
Southwest Airmotive Company	Dallas
Glen Lakes Aviation Company	Dallas
Long Airlanes	Decatur
North Texas Aviation Company	Denton
Hall Flying Service	Eagle Pass
Farm Air Service	El Campo
Falcon Aviation School	Falfurrias
Pecos County Airways	Fort Stockton
City of Fort Worth	Fort Worth
A C Flying Service	Galveston
Garwood Aviation	Garwood
Emmett Flying Service	Genoa
Schneider Flying Service	Giddings
John A. Jackson	Goldthwaite
Graham Aviation Service	Graham
Greenville Majors Aviation	Greenville
Sky Travel, Inc.	Houston
Southern Sales & Transportation Co.	Houston
Cliff Hyde Flying Service	Houston
Kerrville Flying Service	Junction
Kerrville Flying Service	Kerrville
Moyer Flying Service	Killeen
Frank Hogg Airport	Lamesa
Liberty Air Activity	Liberty
Lubbock Aviation Company	Lubbock
Lufkin Flying Service	Lufkin
Rogers Air Service	Marlin
L. P. Nolen	Mercedes
Mexia Flying Service, Inc.	Mexia
Wisener School of Aeronautics	Mineola
City of Monahans	Monahans
Mayhew Aerial Service	Olney
E. W. Brown, Jr.	Orange
Brockman Aerio Service	Pearland
Jefferson County	Port Arthur-Beaumont
Bob Tanner Aviation Services & Supplies	Port Lavaca
Gorman Fox	Raymondville
Fancher Air Service	Refugio
Lane Airpark	Rosenberg
Saginaw Airport	Saginaw (Ft. Worth)
Davis Airport	San Antonio
Howard Aerio Service	San Antonio
Monroe & Witt Flying Service	San Antonio
Schneider Flying Service	Seguin
Smithville Flying Service	Smithville
Jones & Ogden	Stowell (Winnie)
W. J. Worsham	Taft
The Taylor School of Aeronautics	Taylor
Reed's Air Service	Temple
Gulf Coast Airport	Texas City
Baugh Airport	Velasco (Freeport)
Victoria County Airport	Victoria
Stoddard Aero Service	Wink

You'll love the DOVE.....
DESIGN for MAINTENANCE

Economical operation of the Dove is derived from the ease, simplicity and speed with which maintenance tasks can be performed. The maintenance factor has therefore been a dominant design consideration in the building of the Dove to airline standards.

The aircraft is so designed that all parts needing periodical checks can be easily removed, interchanged, and the overhauling done while the aircraft is in the air earning revenue. Two men can change an engine in only 70 minutes.

With a few exceptions the entire aircraft may be inspected and worked on without the use of steps or platforms, thus affording an unusual freedom of movement and of access to the work . . . leading to still further economy in man hours. Features of the Dove which require normal routine inspection are without exception instantly accessible through hinged access doors or by removing toggle fasteners, and are disposed about the aircraft so that several mechanics can work simultaneously without obstructing each other. Many components are interchangeable, including power plants and landing gear. Thus, the economical maintenance of the Dove depends upon simplicity, accessibility and interchangeability.

Riley Aircraft

LONGVIEW, TEX.
GREGG COUNTY AIRPORT

SHREVEPORT, LA.
423 CROCKETT ST.